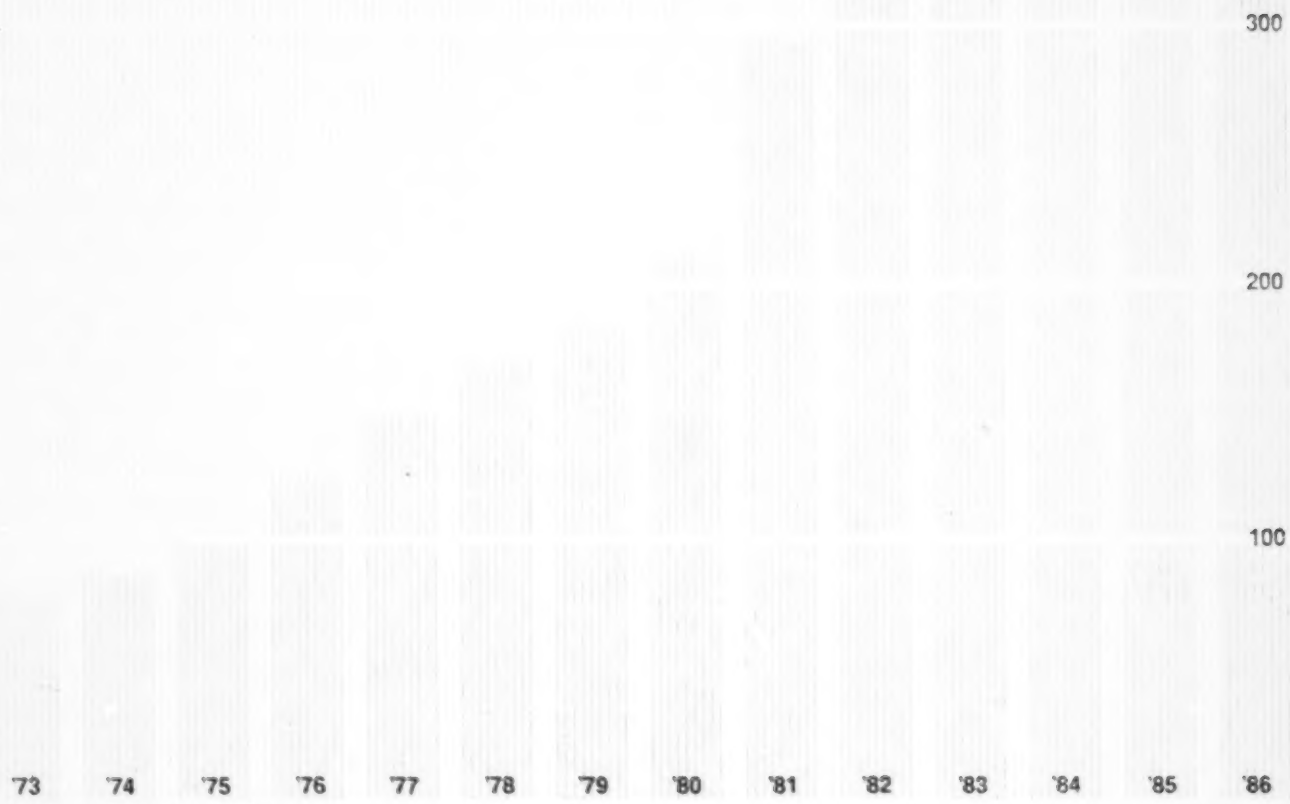
FARM FUEL REQUIREMENTS
ENERDEMO PROJECT RESULTS

by
A. Rutherford and M. Gimby



SASKATCHEWAN FARM PETROLEUM PRODUCTS OPERATING EXPENSE (Thousands of Dollars)

SRC Technical
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INTRODUCTION

Approximately a billion litres of gasoline and diesel fuel are consumed in crop production each year by Saskatchewan farms. This annual input accounts for a significant portion of operating expenses (Fig. 1), emphasizing the need for ongoing attention to efficient fuel use. Mutual concerns are cost control and the conservation of a nonrenewable energy resource.

FARM OPERATING EXPENSES
(Agricultural Statistics, 1986)

	1977	1981	1986
		$ Million	
Taxes	45.4	69.1	106.8
Farm Rent	109.2	236.5	235.9
Wages	67.8	124.0	195.9
Interest	141.3	448.7	416.9
Fuels & Lubricants	150.3	296.2	366.3
Machinery Repairs	170.1	272.0	306.1
Fertilizer	61.6	198.9	346.6
Pesticides	57.5	131.2	230.9
Other Crop Expenses	26.0	47.3	73.8
Livestock Expenses	57.2	135.7	116.9
Building Repairs	27.1	38.2	34.4
Utilities	33.7	43.7	68.2
Misc. Expenses	119.0	200.0	269.3
Total Operating Exp.	1066.2	2241.5	2768.0
Total Operating & Depreciation Expenses	1449.0	2909.4	3442.3
GROSS INCOME	2238.5	4484.0	4830.0
NET INCOME	789.5	1574.6	1387.7

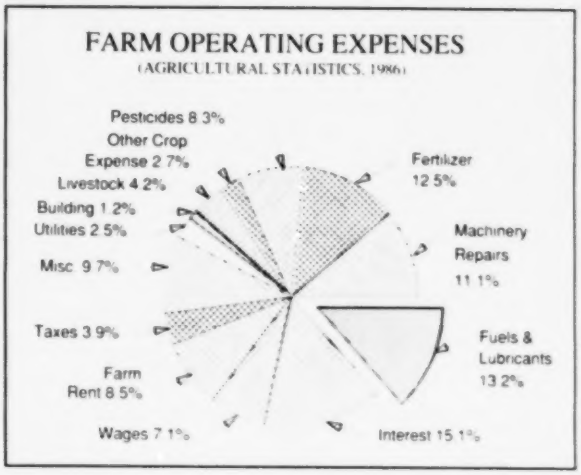

Figure 1. Fuels and lubricants percent of Farm Operating Expense

Fuel requirements for common field operations and cropping practices are summarized in this report. Consumption quantities are presented as a guideline reference to assist farms in a review of their fuel usage. The figures given are based on actual fuel measurements taken, during 1985 and 1986, by 54 farms participating in Farm Enerdemo (Fig. 2), an energy monitoring project funded by Energy, Mines and Resources, Canada.

Figure 2. Location of farms participating in Farm Enerdemo.

FUEL MONITORING

The measurement of fuel consumption, in relation to farm activities is a relatively recent concept for determining effective use. Routine or selective monitoring has recognized value in two general areas:

- identifying opportunities for lower fuel usage within existing operating practices,
- establishing levels of fuel input for comparison to similar or alternative cropping approaches documented for other farms.

Measured or perceived fuel savings enable informed decisions to be made on worthwhile economic changes. Application of the technique requires fuel meter installation (Fig. 3) on supply tanks and a suitable recording procedure for assigning fuel consumed by power equipment and vehicles to specific operations (Fig. 4). Additional noting of acreage covered, operating

Figure 3. Fuel meter installed on supply tank.

Figure 4. Suitable recording procedures for assigning fuel consumed by power equipment and vehicles

Table 1.
Average Unit Operations Fuel Consumption Rates - All Farms (1985, 1986)

Field/Farmstead Operation	Machine Units	Number Observations	Litres (d.f.e.)* per Acre Range	Average	Std. Dev.
Cultivators (primary till)	64	427	1.24-3.04	2.00	±0.37
(secondary Tillage)	35	180	1.15-2.54	1.62	±0.33
Discs (Tandem, Offset	14	38	1.17-5.15	2.60	±1.20
Rodweeders	32	114	0.59-1.89	1.18	±0.52
Discers (seeding)	24	110	0.93-2.60	1.93	±0.39
Press drills (disc)	16	108	0.78-1.39	1.11	±0.18
Hoedrills	14	58	1.04-2.34	1.61	±0.40
Seedrite	5	28	1.97-2.98	2.32	±0.36
Airseeders	15	99	1.57-3.00	2.05	±0.43
Zero-till drills (disc)	7	41	1.34-1.58	1.44	±0.08
(hoe)	6	32	2.15-2.34	2.24	±0.08
Harrows	56	218	0.31-1.25	0.60	±0.18
Harrow-Packers	18	74	0.48-1.37	0.87	±0.23
Fertilizer banding	40	165	1.23-3.93	2.27	±0.59
Fertilizer broadcast	12	17	0.26-1.07	0.73	±0.49
Chemical Applicators	4	6	0.43-1.38	0.78	±0.37
Sprayers	53	213	0.14-0.83	0.38	±0.16
Rockpickers (seeded acreage)	19	23	0.06-0.46	0.26	±0.12
Swathers (S.P.)	21	98	0.25-1.89	1.00	±0.43
(pull)	50	182	0.29-1.49	0.78	±0.24
Combines (S.P.-pickup)	30	177	1.34-4.62	2.85	±1.00
(S.P.-straight cut)	18	69	1.31-5.25	2.64	±0.98
(pull-pickup)	29	213	1.28-4.67	2.85	±0.86
Heavy Trucks (per seeded acreage) -grain & misc. hauling		33	-	1.24	±0.62
Light Vehicles (per seeded acreage) -general support		20	-	2.38	±1.16

* d.f.e = diesel fuel equivalents, for gasoline units multiply by 1.12.

hours, speed and other factors of interest allows various comparisons to be made. Unit log books (Fig. 5), in a general purpose format, are available from the Saskatchewan Department of Agriculture, District Offices.

Evaluations of crop production are most conveniently attained from basic **per operation** fuel requirements. Table 1 shows an overview of fuel used in field operations from data gathered on the 54 participating farms. Included are the number of machine units and fuel record entries used to determine each listed average. Inherently, routine monitoring integrates the affects of individual farm variables (road travel, topography) producing a range of values. Apart from harvesting operations, Table 2 indicates little variation can be attributed to soil zone location.

General fuel use by vehicles, given in terms of overall seeded acreage, includes only the proportion considered a requirement for crop production. Consumption figures represent the pooled quantity of all vehicles in the classification group. This figure also includes minor fuel usage by miscellaneous equipment (grain augers, water pumps) common to the farmstead application. In most cases, cooperator estimates were used to proportion each vehicle's seasonal fuel total to obtain the aggregate amount. Marketing deliveries were excluded from heavy truck estimates to achieve a more uniform farm area value. Transportation support of cropping enterprises appears to be in the order of 4 litres per seeded acre.

All litre per acre averages are quoted as diesel fuel equivalents based on standard energy con-

Table 2.
Unit Operations Fuel Consumption Rates by Soil Zone Location

Field/Farmstead Operation	Litres (d.f.e.)* per Acre					
	Brown		Dark Brown		Blacks	
	Range	Average	Range	Average	Range	Average
Cultivators (primary till)	1.24-2.92	2.04	1.18-2.32	1.96	1.59-3.04	2.01
(secondary tillage)	1.39-2.54	1.84	0.81-1.88	1.49	1.24-2.03	1.63
Discs (Tandem, Offset)	2.84-4.78	3.57	1.17-3.10	1.83	1.48-5.15	2.52
Rodweeders	0.95-1.58	1.05	0.59-1.96	1.14	0.87-1.89	1.34
Discers (seeding)	1.53-2.27	1.97	0.93-1.90	1.63	2.47-2.60	2.54
Press drills (disc)	-	1.11	0.83-1.39	1.18	0.78-1.38	1.06
Hoedrills	1.31-1.93	1.69	1.21-1.86	1.47	1.04-2.34	1.65
Seedrite	-	-	-	2.10	1.97-2.98	2.38
Airseeders	-	3.00	1.57-2.22	1.87	1.76-2.90	2.11
Zero-till drills (disc)	1.34-1.41	1.38	-	1.58	1.44-1.45	1.45
(hoe)	-	2.15	-	2.34	2.18-2.34	2.24
Harrows	0.60-0.93	0.76	0.31-1.25	0.60	0.31-0.69	0.54
Harrow-Packers	0.96-0.99	0.98	0.48-1.03	0.76	0.64-1.37	0.87
Fertilizer banding	1.82-2.77	2.30	1.39-3.93	2.28	1.23-3.79	2.25
Fertilizer broadcast	0.26-1.98	0.90	0.47-1.01	0.74	0.43-0.80	0.56
Chemical Applicators	-	-	0.43-1.38	0.91	0.53-0.78	0.66
Sprayers	0.20-0.46	0.35	0.20-0.83	0.39	0.14-0.62	0.39
Swathers (S.P.)	0.25-1.92	0.89	0.91-1.47	1.09	0.69-1.89	1.01
(pull)	0.48-1.02	0.76	0.35-1.17	0.78	0.29-1.49	0.79
Combines (S.P.-pickup)	1.34-4.32	2.18	1.68-3.32	2.64	1.53-4.62	3.38
(S.P.-straight cut)	1.81-3.89	2.46	1.65-3.36	2.53	1.31-5.25	2.90
(pull-pickup)	1.83-4.67	2.81	1.28-4.12	2.76	2.18-4.11	2.99

*d.f.e = diesel fuel equivalents, for gasoline units multiply by 1.12
Values without a range are single observations.

tent values (1 litre of gasoline = 0.897 litres diesel). The adjustment for mixed fuel applications allows for easier comparisons to other farms.

Specific fuel use, developed from project fueling records, in general confirm expected monitoring benefits. Most farm summaries indicate litre per acre differences among field

Table 3.
Selected Examples of Potential Fuel Saving Actions (Enerdemo Project Farms - 1985, 1986)

Project Illustration Possible Action	Farm No.	Operation	Fuel Saving per 1000 acres or miles	
			litres	dollars*
Tractor selection	6	Cultivating-primary tillage	800	278
		Fertilizer banding	610	212
Gear up-throttle down operating	9	Discer seeding - same tractor	470	163
	18	Harrow-packer-high Hp tractor contrasted to lower Hp tractor	390	135
Alternative equipment or harvesting method	9	Swathing-self propelled versus pull type unit	400	139
	32	Combining - straight cut versus swathing	1470	510
Vehicle selection	40	Heavy truck - grain and misc. hauling	395	147
	28	Light truck - general support of farm operations	288	107

* Savings based on gasoline @ 37.3 ¢/l, diesel fuel @ 34.7 ¢/l

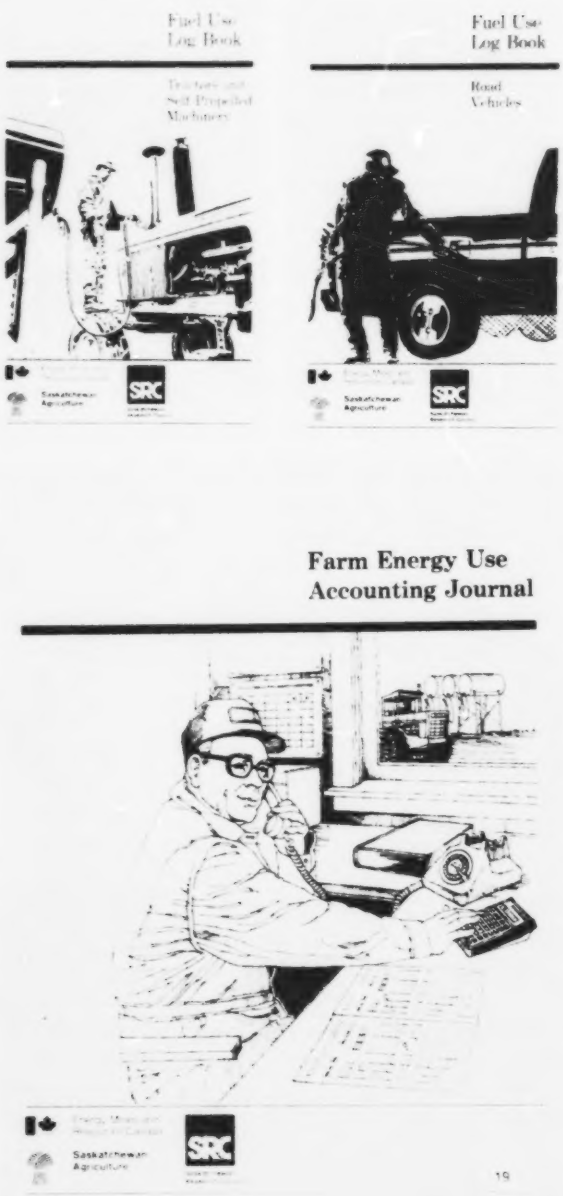

Figure 5. Unit log books are available from Saskatchewan Department of Agriculture, District Offices

operations or combinations of similar cropping application. Apparent options for reduced fuel consumption tend to group into three categories:

- selecting the most efficient tractor or vehicle for the farmstead task,
- modifying operating habits such as wider use of gear up throttle down, minimum tillage overlap and expedient field work patterns,
- reducing the number of field operations through single pass equipment combinations or more extensive changes in cropping practices.

Numerous examples of these aspects can be found in the individual farm data section. Potential fuel savings range up to 1.5 litres per acre (ca. 3.7 litres/ha) for various field operations and average close to 0.2 litres per mile (ca. 12.4 litres/100 km) for efficient light truck selection. Although these figures appear negligible on an acreage or mileage basis, over the course of a farm season, the values translate into appreciable amounts of fuel. Data illustrated by Table 3 implies a modest investment in fuel metering can have an early pay-back in lower fuel costs.

ANNUAL CROP REQUIREMENTS

Annual fuel use for crop production is largely determined by tillage and crop rotation practices. Apparent norms, based on cropping systems reported by the Enerdemo Farm group, are presented from this perspective. For comparison purposes, tillage systems are defined according to the extent of soil disturbance occurring in the planting year and are as follows:

Conventional Tillage - unrestricted operations involving fall and/or spring season pre-seeding cultivation.

Minimum T lage - single pass seeding operation resulting in complete soil disturbance, commonly the use of discer or air seeder equipment.

Zero Tillage - seed row disturbance only, usually in conjunction with a desiccant herbicide application.

Table 4.
Field Operations Fuel Use by Crop Group

All Farm Overview

Crop Group	Summerfallow Crop			Stubble Crop		
	Farms	Obs*	Litres/Acre	Farms	Obs*	Litres/Acre
Spring Wheats	27	147	12.2	41	231	9.0
Winter Wheat				19	59	5.6
Coarse Grains	11	13	10.1	29	108	10.4
Oilseeds	14	29	17.9	18	86	11.0

Soil Zone Location

Crop Group	Summerfallow Crop			Stubble Crop		
	Brown	Dark Brown	Blacks	Brown	Dark Brown	Blacks
		(litres per Acre)			(litres per Acre)	
Spring Wheats	10.8	12.5	14.0	8.2	8.2	10.5
Winter Wheat				4.7	5.3	6.8
Coarse Grains	10.0	9.8	12.3		9.1	11.0
Oilseeds	10.5	14.0	19.6		8.4	11.6

Tillage System

Crop Group	Summerfallow Crop			Stubble Crop		
	Conventional	Minimum	Zero-till	Conventional	Minimum	Zero-till
		(litres per Acre)			(litres per Acre)	
Spring Wheats	14.3	10.4		10.9	8.2	7.4
Winter Wheat						5.6
Coarse Grains	10.9	9.3		11.2	7.4	8.0
Oilseeds	19.3	11.1		12.7	+	8.1

* number of field observations analysed on reporting farms.
+ insufficient observations to quote an average.

ANNUAL CROP REQUIREMENTS

Allowance was made for separate fertilizer banding, harrow-packing and straw spreading operations for the minimum and zero tillage systems. Fuel use for each crop situation was determined from a listing of field operations and their respective fuel consumption rates. Comparison of these estimates to actual seasonal fuel measurements, for selected fields or by a whole-farm review, indicate an accuracy within 10 percent.

Fuel requirements by crop group are shown in Table 4. The results predominately represent hard spring wheat, barley and canola production. Estimate averages cover the post-harvest to end of harvest period for each rotation position. Cereal crops on summerfallow, over the 2 year production period, consume 10 to 14 litres per acre compared to an 8 to 11 litre per acre range for stubble crops in one year. The corresponding comparison for oilseed is wider in range due to additional tillage and press drill seeding preference on most project farms. At minimum, stubble cropping requires 3 to 4 litres less fuel per acre due to the residual effect of fuel consumed in summerfallowing (Fig. 6). Better fuel efficiency, in terms of kilograms of grain per litre, occurs if stubble yields can exceed two-thirds summerfallow production. More continuous cropping offers the potential for lower unit production cost of fuels, but does not in general reduce annual fuel expense. Lowest fuel use is shown for minimum and zero-till systems. Both are similar in the number of field operations and fuel requirement. Project estimates indicate a fuel reduction of 3 to 4 litres per acre over conventional tillage, regardless of crop rotation position. Consumption for stubble crops range from 6 to 8 litres per acre while summerfallow applications are about 11 litres per acre. A fuel benchmark for fallow crops by a pure zero tillage approach is unavailable as no farms reported extensive chemical fallow. Similarly, crop choice excluded stubble observations for coarse grains and oilseeds in the Brown soil zone.

Overall fuel consumption, including transportation support of cropping activities, range from 10 to 18 litres per seeded acre. Mid to lower range requirements are associated with stubble cropping by either conventional or reduced til-

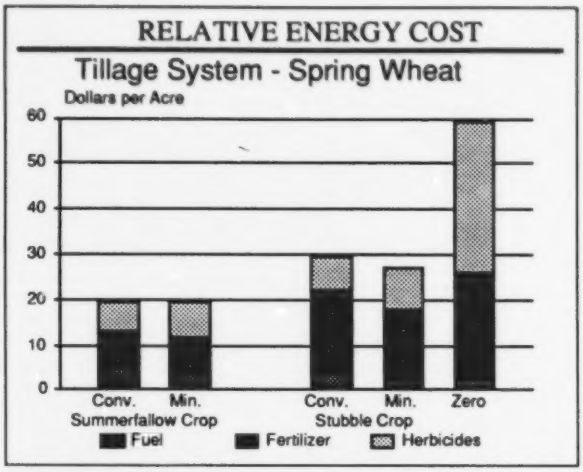

Figure 7. Relative energy cost by tillage system for spring wheat production (Enerdemo Project Farms, 1986)

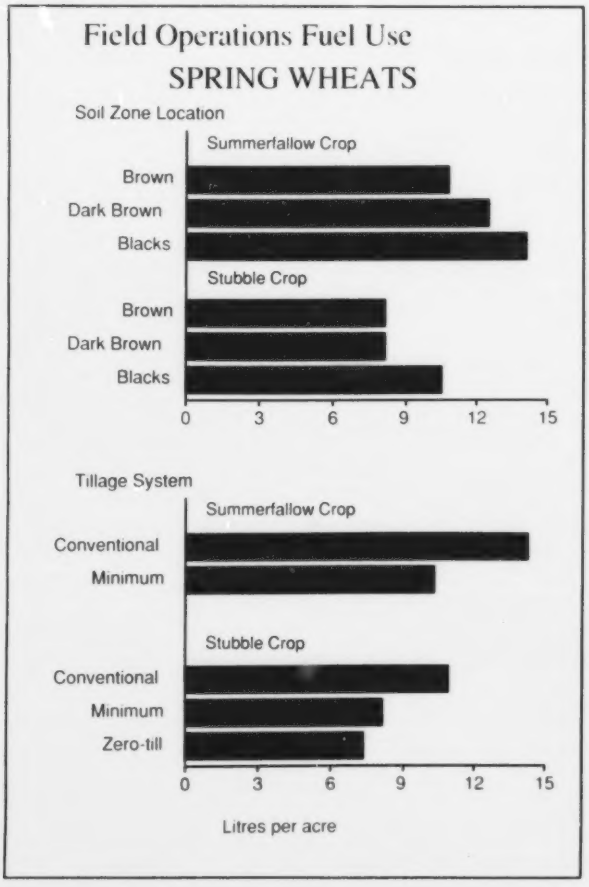

Figure 6. Field operating fuel use.

Table 5.
Average Fuel, Fertilizer and Herbicide Cost per Acre - Spring Wheat, Enerdemo Project Farms (1986)

Tillage System	Soil Zone	Summerfallow crop Farms /Obs.	Fuel	Fert.	Herb.	Total	Stubble Crop Farms /Obs.	Fuel	Fert.	Herb.	Total
			dollars per acre*					dollars per acre*			
Conventional	Brown	3/19	4.43	5.38	4.10	13.91	1/1	2.76	22.93	10.57	36.26
	Dk. Brown	6/12	5.28	6.91	6.03	18.22	8/25	3.71	15.58	4.93	24.22
	Blacks	4/6	5.74	10.38	10.37	26.49	12/36	4.26	19.50	9.34	33.10
		13/37	5.23	7.63	6.92	19.78	21/62	3.98	18.17	7.72	29.87
Minimum	Brown	4/12	3.67	7.00	7.10	17.77	4/8	2.52	10.67	6.75	19.94
	Dk. Brown	4/12	4.02	8.27	9.45	21.74	8/32	2.90	17.37	10.71	30.98
	Blacks	0/0	-	-	-	-	0/0	-	-	-	-
		8/24	3.85	7.64	8.28	19.77	12/40	2.77	15.14	9.39	27.30
Zero-till	Brown	0/0					0/0	-	-	-	-
	Dk. Brown	0/0					1/3	1.66	20.86	39.13	61.65
	Blacks	0/0					4/6	3.05	23.47	32.14	58.66
		0/0	-	-	-	-	5/9	2.77	22.95	33.54	59.26
All systems	All zones	21/61	4.70	7.63	7.44	19.77	38/111	3.44	17.84	11.64	32.92

* Input commodity costs based on non-discount quotations by Saskatoon area suppliers.

lage methods. Fuel efficient minimum and zero-till systems tend to incur additional fertilizer and/or herbicide input expense, resulting in narrower profit margins than a traditional crop-fallow practice (Tables 5 and 6, Fig. 7). In this respect, a minimum tillage approach, independent of cropping rotations, appears the most favorable.

Table 6.
Average Grain Productivity per Fuel, Fertilizer and Herbicide Cost - Spring Wheat, Enerdemo Project Farms (1986)

Tillage System	Soil Zone	Summerfallow Crop Farms /Obs.	Kilograms/Energy Cost ($) Actual (1986)	Expected (Crop Ins.)	Stubble Crop Farms /Obs.	Kilograms/Energy Cost ($) Actual (1986)	Expected (Crop Ins.)
Conventional	Brown	3/19	76(2.8)	60(2.2)	1/1	19(0.7)	14(0.5)
	Dk. Brown	6/12	57(2.1)	44(1.6)	8/25	38(1.4)	27(1.0)
	Blacks	4/6	33(1.2)	35(1.3)	12/36	30(1.1)	25(0.9)
		13/37	54(2.0)	46(1.7)	21/62	33(1.2)	25(0.9)
Minimum	Brown	4/12	76(2.8)	63(2.3)	4/8	35(1.3)	27(1.0)
	Dk. Brown	4/12	49(1.8)	38(1.4)	8/32	27(1.0)	22(0.8)
	Blacks	0/0	-	-	0/0	-	-
		8/24	63(2.3)	49(1.8)	12/40	30(1.1)	25(0.9)
Zero-till	Brown	0/0			0/0	-	-
	Dk. Brown	0/0			1/3	8(0.3)	8(0.3)
	Blacks	0/0			4/6	19(0.7)	11(0.4)
		0/0	-	-	5/9	16(0.6)	8(0.3)
All systems	All zones	21/61	57(2.1)	46(1.7)	38/111	30(1.1)	22(0.8)

( ) Bushel equivalent
*Long term yield average from Saskatchewan Crop Insurance Tables

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FARM SUMMARIES

General information on fuel use provided by the Enerdemo Farms is presented in the following section. Average consumption rates are based on selected fuel records solely related to each operation consistent with equipment size. Hourly rates and mileage rates are quoted in terms of actual fuel type whereas acreage rates are presented as diesel fuel equivalents (d.f.e.). Farms identified by numbers 1 to 23 are former Farm Energy Management Program cooperators (F.E.M.P., 1980-83).

Farm No. 1
NC Black Soil Zone

Acreage: 1267 Cultivated (Total 1440)
cropped 1267, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8440	D	2	-	-	1.99 - 2.81	2.40
Rodweeder	JD 4640	D	3	-	-	0.97 - 1.60	1.33
Hoedrill	JD 4640	D	4	-	-	1.35 - 1.44	1.41
Harrows	JD 4640	D	1	-	-	-	0.68
Fertilizer banding (dry)	JD 8440	D	2	-	-	2.55 - 2.62	2.59

Farm No. 2
NE Black Soil Zone

Acreage: 1816 Cultivated (Total 2720)
Cropped 1204, fallow 477, hay 135

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	IH 3588	D	25	19.39 - 30.40	24.64	1.82 - 2.96	3.26
	IH 1256	D	5	21.80 - 30.00	24.80	1.44 - 2.67	1.95
(secondary tillage)	IH 3588	D	9	17.17 - 29.00	21.54	1.38 - 2.38	1.66
(breaking hayland)	IH 3588	D	1	-	-	-	3.24
Rodweeder (multiplex)	IH 3588	D	1	-	25.47	-	1.89
Airseeder	Case 4490	D	1	-	24.27	-	2.08
Press drill (d.d.)	IH 706	D	1	-	-	-	0.99
Seedrite	IH 1256	D	1	-	-	-	2.17
Harrows	IH 3588	D	1	-	17.44	-	0.60
	IH 1256	D	13	16.15 - 21.82	18.10	0.32 - 0.80	0.60
Sprayer	IH 706	D	6	7.36 - 8.33	7.97	0.26 - 0.35	0.30
Fertilizer banding	Case 4490	D	6	22.42 - 32.54	29.09	1.52 - 3.01	2.43
(anhydrous)	IH 3588	D	3	22.33 - 28.05	25.00	2.09 - 2.23	2.15
Rockpicker							
(seeded acreage)	IH 706	D	2	6.12 - 10.50	8.05	0.13 - 0.35	0.24
Swather SP	White 6400	D	4	9.93 - 13.62	11.30	0.85 - 1.35	1.12
Combine (SP-pickup)	MF 860	D	15	20.00 - 29.43	23.75	1.92 - 5.28	3.86
(pull-pickup)	IH 3588	D	1	-	13.67	-	2.91

Farm No. 5
SC Dark Brown Soil Zone

Acreage: 1180 Cultivated (Total 1280)
Cropped 944, fallow 236

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators	Case 2394	D	2		27.29	1.99 - 2.39	2.19
Discer (seeding)	Case 2394	D	6	17.07 - 22.61	19.25	1.30 - 2.06	1.78
Zero-till drill (disc)	Case 1070	D	1		13.17		1.58
Harrowing	Case 1070	D	4	14.63 - 18.64	16.40	0.47 - 0.54	0.50
Harrow Packer	Case 1070	D	1		16.82		0.48
Spraying	Case 1070	D	1		10.28		0.23
Swathing (pull)	Case 1070	D	1		-	0.32 - 0.37	0.35
Combine (SP-pickup)	Case 2394	D	4		15.13	1.39 - 3.56	2.32
Heavy Trucks							
(grain & misc. hauling)	Dodge 3 T	G	1		3.4 mpg		2.06
	IH 1 1/4 T	G			7.6 mpg		

Farm No. 6
NE Black Soil Zone

Acreage: 2115 Cultivated (Total 2880)
Cropped 1895, fallow 85, hayland 135

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators							
(primary till-fall)	White 2-135	D	6	27.61 - 33.65	31.09	2.37 - 3.48	2.70
	Deutz DX 710	D	5	17.82 - 24.13	21.27	1.75 - 2.11	1.90
	Deutz DX 160	D	14	14.43 - 18.56	17.03	1.54 - 2.94	2.13
(primary till-spring)	White 2-135	D	8	24.40 - 29.80	26.58	1.93 - 2.85	2.28
	Deutz DX 710	D	6	18.62 - 23.82	22.13	1.59 - 1.91	1.79
	Deutz DX 160	D	6	15.00 - 19.48	17.21	1.34 - 1.83	1.53
(secondary tillage)	Deutz DX 710	D	2	22.62 - 26.24	24.43	1.85 - 2.25	2.05
	Deutz DX 160	D	5	14.43 - 16.43	15.62	1.44 - 1.63	1.52
(Treflan Incorp.)	White 2-135	D	5	17.67 - 24.50	22.30	2.02 - 3.27	2.49
	Deutz DX 710	D	4	24.33 - 27.34	25.65	1.97 - 2.31	2.10
	Deutz DX 160	D	4	14.90 - 16.33	15.50	1.94 - 2.05	2.00
(breaking hayland)	White 2-135	D	2	-	25.14	2.45 - 2.54	2.50
Cultivator/Packer	Duetz DX 710	D	5	17.18 - 22.78	19.48	1.23 - 1.46	1.36
Cultivator/Harrow-Packer	White 2-135	D	6	23.80 - 26.94	25.56	2.27 - 2.96	2.60
	Deutz DX 710	D	10	21.38 - 24.19	23.05	1.55 - 2.62	1.91
Disc (offset)	White 2-135	D	2	18.97 - 29.92	24.45	4.95 - 7.50	6.23
	Deutz DX 710	D	2	20.26 - 21.28	20.77	-	4.06
Rodweeder/Harrow-Packer	White 2-135	D	8	20.56 - 24.85	21.23	1.43 - 2.12	1.85
Press drill (d.d.)	Deutz 10006	D	21	7.61 - 9.57	8.45	0.57 - 1.12	0.78
Harrow Packer	White 2-105	D	4	16.67 - 24.00	21.08	0.41 - 0.75	0.64
	Deutz DX 710	D	1	-	16.23	-	0.66
Harrows (diamond)	White 2-105	D	2	16.04 - 18.87	17.46	0.40 - 0.43	0.42
	White 2-135	D	1	-	16.79	-	0.46
Harrows (diamond)	Deutz DX 160	D	1	-	13.12	-	0.37
Fertilizer banding	White 2-135	D	7	21.05 - 25.00	24.00	2.35 - 3.33	2.82
(anhydrous)	Deutz DX 710	D	4	18.96 - 20.60	19.74	1.78 - 2.14	2.03
	Deutz DX 160	D	16	15.33 - 19.20	17.26	1.84 - 2.68	2.21
Fertilizer broadcast	White 2-105	D	5	8.46 - 12.68	11.32	0.63 - 1.02	0.86
	Deutz DX 710	D	1	-	11.53	-	0.52
Sprayer	White 2-105	D	6	8.89 - 11.75	10.09	0.34 - 0.48	0.39
	Deutz DX 710	D	5	9.11 - 10.79	10.09	0.27 - 0.34	0.30
Swather (pull)	Deutz 1006	D	4	5.67 - 7.04	6.07	0.46 - 0.77	0.55
(SP-grains)	CCIL 21'	G	14	6.53 - 8.17	6.95	0.45 - 0.83	0.69
(SP-haying)	CCIL 21'	G	9	5.66 - 7.91	6.65	0.61 - 1.58	1.18
Combines (pull-pickup)	White 2-135	D	4	13.78 - 24.21	18.76	2.97 - 3.99	3.41
	Deutz DX 160	D	14	11.52 - 14.05	12.69	1.69 - 3.34	2.48
Heavy Trucks	Chev 3 T '60	G			6.1 mpg		
(grain & misc. hauling)	Ford 3 T '64	G			7.9 mpg		
	Chev 3 T '70	G	2		4.5 mpg		1.64
	GMC 3 T '76	G			6.5 mpg		
Light Vehicles	Chev 1/2 T '69	G			8.6 mpg		
(general support)	Chev 1/2 T '70	G			14.8 mpg		
	Dodge 1/2 T '82	G	2		14.3 mpg		2.58
	Ford 3/4 T '84	G			11.1 mpg		
	Plymouth Volare	G			20.8 mpg		

Farm No. 7
NC Black Soil Zone

Acreage: 1210 Cultivated (Total 1236)
Cropped 550, fallow 630, hay 30

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4640	D	18	21.40 - 31.78	28.19	1.14 - 2.14	1.71
	JD 4440	D	4	18.67 - 26.17	22.63	0.93 - 1.13	1.15
(secondary tillage)	JD 4640	D	3	21.43 - 30.20	25.70	1.14 - 1.51	1.31
	JD 4440	D	13	19.29 - 28.33	18.79	1.06 - 1.56	1.42
Disc (tandem)	JD 4440	D	1	-	22.14	-	1.48
Rodweeder	JD 4240	D	4	15.43 - 25.00	20.23	1.09 - 1.72	1.46
Press drill (d.d.)	JD 4440	D	11	11.67 - 19.67	16.00	1.09 - 1.57	1.38
	JD 4240	D	9	14.50 - 16.71	15.78	1.27 - 1.46	1.37
Harrows	JD 4440	D	2	16.75 - 18.13	17.44	0.52 - 0.61	0.57
	JD 4240	D	2	15.50 - 17.16	16.55	0.52 - 0.63	0.63
Fertilizer banding (anhydrous)	JD 4640	D	1	-	21.78	-	2.31
Sprayer	JD 4240	D	2	11.63 - 11.92	11.78	0.26 - 0.34	0.30
Swather (pull)	JD 4240	D	6	9.33 - 12.23	11.26	0.91 - 1.08	1.04
Combines (pull-pickup)	JD 4640	D	5	17.43 - 19.17	17.99	1.27 - 3.00	1.99
	JD 4440	D	12	14.55 - 20.78	17.25	1.33 - 3.25	2.59
	JD 4240	D	3	14.50 - 16.22	15.57	1.22 - 3.87	2.94

Farm No. 9
WC Dark Brown Soil Zone

Acreage: 680 Cultivated (Total 800)
Cropped 415, fallow 274, hay/pasture 80

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Deutz 7206	D	12	5.92 - 11.70	7.98	0.86 - 1.64	1.18
(secondary tillage)	Deutz 7206	D	9	5.64 - 8.73	7.20	0.50 - 1.11	0.81
(breaking hayland)	Deutz 7206	D	1	-	7.58	-	2.27
Disc (tandem)	Deutz 7206	D	5	5.00 - 6.36	5.70	0.74 - 1.55	1.21
Rodweeder	Deutz 7206	D	8	6.25 - 7.78	6.90	0.45 - 0.96	0.59
Discer (seeding)	Deutz 7206	D	17	5.69 - 8.40	6.77	0.84 - 1.09	0.93
Harrows (diamond)	Deutz 7206	D	1	-	5.79	-	0.19
(circular)	Deutz 7206	D	5	4.75 - 5.68	5.30	0.38 - 0.46	0.41
Sprayer	Deutz 7206	D	1	-	3.75	-	0.23
	Deutz D50	D	6	-	-	0.20 - 0.31	0.22
Swather (SP)	Vers	G	5	-	-	0.72 - 1.12	0.89
Swather (pull)	Deutz D50	D	5	-	-	0.38 - 0.60	0.49
Combine (SP-pickup)	CCIL M103	D	7	-	-	1.11 - 2.13	1.68
(pull-pickup)	Deutz 7206	D	5	2.73 - 5.78	5.37	1.00 - 1.50	1.28
Heavy Trucks (grain & misc. hauling)	IH 1 T '60	G	1		8.9mpg		0.59

Farm No. 11
NW Black Soil Zone

Acreage: 550 Cultivated (Total 650)
Cropped 290, fallow 260, hay 100

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Deutz DX 90	D	8	9.94 - 11.38	10.51	1.38 - 1.96	1.75
(secondary tillage)	Deutz DX 90	D	5	9.47 - 10.99	10.14	1.19 - 1.74	1.47
	Deutz 7006	D	15	4.60 - 7.66	6.43	1.02 - 1.82	1.46
Discer (tillage)	Deutz 7006	D	1	-	4.55	-	2.47
Rodweeder	Deutz DX 90	D	8	8.45 - 10.83	9.96	0.91 - 1.20	1.08
	Deutz 7006	D	4	5.52 - 6.56	5.99	0.72 - 1.13	0.91
Hoedrill	Deutz DX 90	D	6	7.66 - 8.11	7.85	0.98 - 1.28	1.14
	Deutz 7006	D	3	5.00 - 6.05	5.48	0.82 - 1.30	1.12
Fertilizer banding (dry) (hoedrill applied)	Deutz CX 90	D	1	-	9.72	-	1.34
Rockpicker (seeded acreage)	Deutz DX 90	D	1		5.70		0.33
Swather (pull-hay)	Deutz 7006	D	4	2.24 - 2.64	2.42	0.70 - 0.83	0.74
Combine (SP-straight cut)	Case 1000	G	2	-	-	2.12 - 3.00	2.56
Heavy Trucks (grain & misc. hauling)	IH 1 T	G	1		6.5 mpg		0.96

Farm No. 12
NC Black Soil Zone

Acreage: 142 Cultivated (Total 160)
Cropped 77, fallow 65, hay 18

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Deutz DX 130	D	2	15.88 - 16.30	16.03	1.85 - 1.91	1.88
(secondary tillage)	Deutz DX 130	D	1	-	-	-	1.58
	JD 2130	D	1	-	12.72	-	1.58
Rodweeder	Deutz DX 130	D	1	-	18.73	-	1.29
	JD 2130	D	1	-	7.30	-	1.07
Seedrite	Deutz DX 130	D	4	9.53 - 12.14	11.06	1.81 - 2.01	1.97
Harrows	Deutz DX 130	D	4	8.57 - 10.30	9.40	0.50 - 0.67	0.58
Sprayer	JD 2130	D	2	4.80 - 6.00	5.26	0.28 - 0.29	0.29
Swather (pull)	JD 2130	D	1	-	4.70	-	0.56
Combine (pull-pickup)	Deutz DX 130	D	5	6.35 - 7.04	6.70	2.06 - 3.25	2.81
Heavy Trucks (grain & misc. hauling)	GMC 3 T '64	G	1		7.5 mpg		1.23
Light Vehicles	Chev 1/2 T '78	G			14.4 mpg		
(general support)	Chev 1/2 T '83	G	1		17.8 mpg		3.79
	Cutlass '82	G			33.0 mpg		

Farm No. 13
EC Dark Brown Soil Zone

Acreage: 2582 Cultivated (Total 3680)
Cropped 2107, fallow 475

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4640	D	4	20.09 - 23.70	21.53	1.70 - 2.27	1.98
	JD 4320	D	2	-	-	1.72 - 2.05	1.89
(secondary tillage)	JD 4640	D	5	16.11 - 22.50	20.08	1.21 - 1.63	1.38
	JD 4320	D	4	-	-	0.72 - 1.02	0.87
Airseeder	JD 4640	D	14	21.67 - 29.70	25.33	1.90 - 2.56	2.22
Harrow Packer	Volvo	D	1	-	28.77	-	1.00
Harrows	JD 4020	D	4	11.22 - 11.67	11.44	0.42 - 0.57	0.52
Fertilizer banding (dry)	JD 4640	D	6	26.43 - 28.82	27.16	1.98 - 3.02	2.67
Fertilizer broadcast	JD 4640	D	1	-	16.88	-	1.01
Sprayer	JD 4020	D	2	-	9.51	0.35 - 0.54	0.45
Swather (pull)	JD 4320	D	5	7.60 - 8.80	8.10	0.69 - 1.35	0.93
	JD 4020	D	2	-	8.97	0.94 - 0.97	0.96
Combines (SP-Pickup)	JD 7700	D	8	10.97 - 19.42	15.78	2.16 - 5.92	3.32
(pull-pickup)	JD 4640	D					
Heavy Trucks	Mack R600	D					
(grain & misc. hauling)	Chev 2 T	G	1		6.8 mpg		1.08
	IH 185 2 T	G					
Light Vehicles	Chev 1/2 T '78	G					
(general support)	Chev 1/2 T '78	G	1				2.77
	Chev 1/2 T '76	G					
	Ford 1/2 T '79	G					

Farm No. 14
SC Brown Soil Zone

Acreage: 2120 Cultivated (Total 2240)
Cropped 1140, fallow 980

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4640	D	2	25.00 - 25.09	25.05	1.77 - 1.82	1.79
(secondary tillage)	JD 4640	D	7	23.20 - 27.10	25.50	1.50 - 2.12	1.76
Rodweeder	JD 4440	D	3	14.80 - 20.83	18.28	1.09 - 1.25	1.18
Discer (seeding)	JD 4640	D	5	20.70 - 24.10	21.70	1.55 - 2.14	1.85
(with packers)	JD 4440	D	4	14.70 - 20.97	18.30	1.63 - 2.22	1.92
Harrows	JD 4440	D	3	15.00 - 19.73	17.68	0.38 - 0.61	0.60
Fertilizer banding	JD 4640	D	1	-	24.20	-	2.13
Sprayer	JD 4440	D	4	10.25 - 14.33	12.74	0.27 - 0.51	0.39
Swathers (pull)	JD 4440	D	11	10.10 - 12.15	10.93	0.70 - 1.04	0.86
Combine (pull-pickup)	JD 4640	D	10	17.06 - 20.58	18.80	1.56 - 2.14	1.83
Heavy Trucks	GMC 3 T	G	1		6.0 mpg		0.57
(grain & misc. hauling)	GMC 2 T	G			6.6 mpg		

Farm No. 18
WC Brown Soil Zone

Acreage: 3310 Cultivated (Total 3360)
Cropped 1680, fallow 1630

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8450	D	8	32.70 - 37.99	35.52	1.83 - 2.01	1.93
Rodweeder	Case 1175	D	4	21.50 - 29.50	24.07	0.95 - 1.18	1.04
	JD 8450	D	5	21.10 - 21.67	21.34	0.78 - 1.22	0.94
(avadex incorp.)	JD 8450	D	4	18.67 - 19.71	19.19	0.82 - 1.22	0.94
Discer (seeding)	JD 8450	D	4	18.64 - 22.38	20.93	0.64 - 1.70	1.35
	Case 1175	D	1	-	22.71	-	2.65
Harrow Packer	JD 8450	D	1	-	18.60	-	0.66
	Case 1175	D	5	27.33 - 30.93	28.55	0.92 - 1.31	1.05
Fertilizer banding	JD 8450	D	1	-	32.79	-	2.30
Sprayer	Case 1175	D	1	-	14.78	-	0.47
	JD 4230	D	1	-	-	-	0.32
	JD 4020	D	3	12.33 - 13.20	12.84	0.30 - 0.33	0.31
Swather (pull)	Case 1175	D	6	7.00 - 14.77	9.14	0.23 - 1.20	0.65
Combine (SP-pick up)	MF 860	D	4	21.25 - 21.65	21.42	1.06 - 2.04	1.34
Heavy Trucks (grain & misc. hauling)	GMC 3 T '74 / GMC 3 T '81	G / G	1		3.8 mpg		1.13

Farm No. 20
WC Brown Soil Zone

Acreage: 620 Cultivated (Total 640)
Cropped 350, fallow 270

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	IH 1066	D	1	-	-	-	1.24
(secondary tillage)	MF 1130	D	1	-	-	-	1.66
Rodweeder	MF 1130	D	3	-	-	1.10 - 1.64	1.33
	JD 4010	D	1	-	-	-	1.05
	IH 1066	D	1	-	-	-	1.19
Discer (seeding)	IH 1566	D	1	-	-	-	2.12
	IH 1066	D	2	-	-	-	2.42
(tillage)	IH 1066	D	1	-	-	-	1.34
Harrow	IH 660	D	1	-	-	-	0.83
Sprayer	IH 660	D	2	-	-	0.30 - 0.33	0.32
Swather (pull)	JD 4010	D	2	-	-	0.73 - 1.13	0.93
	IH 660	D	2	-	-	0.72 - 1.13	0.93
Combine (pull)	MF 1130	D	1	-	-	-	4.67
	IH 1066	D	1	-	-		

Farm No. 23
NC Black Soil Zone

Acreage: 273 Cultivated (Total 320)
Cropped 200, fallow 10, hay 63

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Deutz DX 90	D	5	6.85 - 8.55	7.54	1.45 - 1.80	1.62
(secondary tillage)	Deutz DX 90	D	6	6.58 - 8.06	7.44	1.18 - 2.02	1.24
Disc tandem (primary)	Deutz DX 90	D	9	5.21 - 10.83	8.87	1.41 - 2.67	1.94
(secondary tillage)	Deutz DX 90	D	6	6.94 - 8.46	7.95	1.36 - 2.20	1.82
Rodweeder (multiplex)	Deutz DX 90	D	7	7.62 - 9.37	8.59	0.87 - 1.23	0.87
Press drill (d.d.)	Deutz DX 90	D	6	4.93 - 9.29	6.36	0.84 - 1.06	0.95
Harrows	Deutz DX 90	D	9	5.29 - 8.00	7.07	0.31 - 0.71	0.49
Sprayer	Deutz DX 90	D	4	4.05 - 4.35	4.19	0.36 - 0.89	0.52
Fertilizer broadcast	Deutz DX 90	D	1	-	4.31	-	0.49
Rockpicker (seeded acreage)	Deutz DX 90	D	1	-	-	-	0.15
Swather (pull)	Deutz DX 90	D	3	3.07 - 4.34	4.04	0.67 - 0.76	0.70
Combine (pull-pickup)	Deutz DX 90	D	9	4.95 - 6.02	5.53	1.82 - 2.60	2.18
Heavy Trucks (grain & misc hauling)	GMC 2 T	G	1		9.6 mpg		1.12
Light Vehicles (general support)	Ford Merc.	G	1		20.1 mpg		2.82

Farm No. 24
WC Dark Brown Soil Zone

Acreage: 780 Cultivated (Total 960)
Cropped 520, fallow 260

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Duetz DX 120	D	1	-	13.03	-	1.74
Discer (seeding)	Duetz DX 120	D	4	9.08 - 10.42	9.81	1.47 - 1.63	1.54
Harrows	Duetz DX 120	D	4	-	-	0.19 - 0.38	0.31
Sprayer	Deutz DX 120	D	2	-	8.33	0.18 - 0.22	0.20
Swather (pull)	Deutz DX 120	D	1	-	13.09	-	0.83
Combine (pull-pick up)	Gleaner C2	G	2	26.88 - 35.50	31.19	2.20 - 2.26	2.23
Heavy Trucks	Ford 3T '67	G	1		10.0 mpg		0.40
(grain & misc hauling)	Chev 3T '52	G			10.0 mpg		

Farm No. 25
SC Brown Soil Zone

Acreage: 1700 Cultivated (Total 2240)
Cropped 1650, fallow 50

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Vers. 700	D	3	33.22 - 35.19	34.09	1.58 - 2.62	2.00
	Stieg. 280	D	5	37.55 - 44.20	40.85	1.75 - 2.24	1.95
Zero-till drill (disc)	Vers. 700	D	3	24.09 - 28.67	26.47	1.23 - 1.33	1.28
	Stieg. 280	D	5	24.86 - 31.59	27.17	1.27 - 1.73	1.48
Fertilizer banding (dry)	Case 2490	D	2	34.04 - 34.14	34.09	2.84 - 2.86	2.85
(aqueous)	Case 2490	D	1	-	39.32	-	2.60
Rockpicker (seeded acreage)	D. Br.*930	D	1	-	-	-	0.34
Combine(SP-straight cut)	IH 1440	D	3	22.58 - 23.24	22.85	2.12 - 2.42	2.29

* David Brown

Farm No. 26
SE Dark Brown Soil Zone

Acreage: 925 Cultivated (Total 1040)
Cropped 587, fallow 338

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	IH 1086	D	13	11.83 - 24.90	20.36	1.75 - 2.81	2.07
(secondary tillage)	IH 1086	D	6	13.05 - 18.61	16.42	1.29 - 1.84	1.55
Press drill (d.d.)	IH 560	D	4	5.60 - 9.32	8.10	0.62 - 1.06	0.87
	IH 1086	D	1	-	13.57	-	0.68
Hoedrill	IH 1086	D	3	18.82 - 21.91	19.94	1.77 - 1.92	1.86
Harrows	IH 560	D	2	9.70 - 10.88	10.29	0.27 - 0.47	0.37
	IH 1086	D	3	12.50 - 23.08	18.53	0.42 - 0.81	0.62
(stubble-straw spreading)	IH 1086	D	5	8.14 - 16.55	14.07	0.54 - 1.07	0.79
Fertilizer banding (dry)	IH 1086	D	3	10.10 - 17.18	14.26	1.58 - 3.35	2.35
Sprayer	IH 560	D	8	7.71 - 12.60	9.58	0.40 - 0.72	0.58
Rockpicker (seeded acreage)	IH 560	D	1	-	-	-	0.29
Swather (pull)	IH 560	D	6	4.43 - 7.71	6.17	0.51 - 1.20	0.94
Combine (SP-pickup)	IH 403	G	7	15.00 - 18.11	16.16	2.10 - 4.12	3.19
(SP-straight cut)	IH 403	G	1	-	19.14	-	3.01
Heavy Trucks (grain & misc. hauling)	IH 1600 3 T	G	1		3.7 mpg		1.17

Farm No. 27
SW Brown Soil Zone

Acreage: 770 Cultivated (Total 800)
Cropped 610, fallow 160

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (breaking)	MF 1805	D	1	-	71.03	-	5.33
Disc (tandem)	MF 1805	D	1	-	-	-	2.84
Rodweeder	MF 1805	D	3	33.14 - 41.28	38.11	1.44 - 1.77	1.37
	JD 830	D	2	-	-	-	0.88
Discer (seeding)	MF 1805	D	4	30.30 - 33.80	32.66	2.02 - 2.66	2.33
	JD 830	D	4	-	-	1.72 - 2.09	1.89
Zero-till drill	JD 830	D	3	10.63 - 11.64	11.23	1.20 - 1.50	1.25
Zero-till drill/Harrow	JD 830	D	1	-	16.19	-	1.62
Harrow	MF 1805	D	2	27.72 - 31.14	29.43	0.96 - 0.97	0.97
	JD 830	D	2	-	-	0.86 - 0.89	0.88
Sprayer	JD 830	D	2	-	-	0.27 - 0.35	0.31
	Chev 1/2 T	D	1	-	-	-	0.34
Fertilizer broadcast	MF 1805	D	1	-	-	-	1.98
Swather (SP)	IHC 4400	G	1				1.92
Combine (SP-straight cut)	NH TR 70	D	4	21.32 - 28.75	23.04	3.48 - 4.45	3.89
Heavy Trucks	Ford 3 T	G	2				0.80
(grain & misc. hauling)	Chev 1 1/2 T	G					
Light Vehicles	Dodge 1/2 T	G	2		14.3 mpg		3.79
(general support)	Chev 1/2 T	G			14.5 mpg		

Farm No. 28
NW Black Soil Zone

Acreage: 2640 Cultivated (Total 2720)
Cropped 2640, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	IH 5488	D	9	27.20 - 57.40	34.41	1.36 - 3.83	2.34
	MF 4840	D	5	25.84 - 44.50	36.99	1.92 - 2.49	2.14
(secondary tillage)	IH 1086	D	5	17.00 - 18.25	17.63	1.04 - 2.15	1.44
	IH 1486	D	12	13.70 - 24.19	19.60	0.99 - 1.89	1.41
Airseeder	IH 5488	D	7	25.56 - 40.17	29.17	1.59 - 2.00	1.76
Airseeder with packers	IH 5488	D	5	27.58 - 32.33	29.58	1.62 - 21.0	1.87
Hoedrill	IH 1086	D	6	9.22 - 14.29	11.65	0.98 - 1.20	1.04
Harrows	IH 1086	D	1	-	11.58	-	0.44
Harrow-Packer	IH 1086	D	6	14.33 - 22.16	18.81	0.63 - 0.89	0.73
Fertilizer banding (dry)	IH 5488	D	10	25.83 - 37.33	32.00	1.89 - 2.95	2.31
	MF 4840	D	3	35.56 - 42.31	37.96	1.96 - 2.46	2.25
(Hoedrill - dry)	IH 1486	D	1	-	42.53	-	1.76
Sprayer (truck unit)	IH 1310	G	6	-	-	0.16 - 0.41	0.20
(tractor unit)	MF 250	D	2	2.74 - 3.22	2.98	0.27 - 0.30	0.29
Rockpicker (seeded acreage)	MF 275	D	7	3.27 - 6.67	4.83	0.09 - 0.13	0.11
Swather (SP)	IH 4000	G	7	-	-	0.83 - 1.08	0.84
(pull)	MF 250	D	3	3.20 - 3.56	3.46	0.21 - 0.41	0.29
Combines (pull-pickup)	IH 5488	D	28	16.20 - 23.78	20.32	1.50 - 6.20	3.38
	IH 1486	D	28	14.40 - 23.56	17.46	2.00 - 6.30	3.56
Heavy Trucks	GMC 7000	D			5.7 mpg		
(grain & misc. hauling)	GMC 6000	G	2		3.9 mpg		0.99
	GMC C65	G			9.1 mpg		
	IH 1310	G			5.4 mpg		
Light Vehicles	GMC 4x4 '84	G			17.5 mpg		
(general support)	GMC 3/4 T '81	G			8.6 mpg		
	GMC 1/2 T '78	G			8.3 mpg		
	GMC Jimmy	G	2		17.3 mpg		1.35
	GMC 1/2 T '82	G			17.2 mpg		
	Suburban '79	G			17.3 mpg		
	Chev Car '76	G			16.2 mpg		
	Chev Car '72	G			17.2 mpg		

Farm No. 29
EC Black Soil Zone

Acreage: 1350 Cultivated (Total 1440)
Cropped 1350, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Duetz DX 160	D	5	10.04 - 15.43	12.63	1.18 - 1.89	1.41
	Duetz DX 160(3)	D	2	13.21 - 15.00	14.11	2.25 - 2.58	2.42
Zero-till drill (disc)	Duetz DX 160	D	22	8.70 - 14.41	11.71	1.20 - 1.69	1.44
Harrows	Duetz DX 160	D	5	11.21 - 11.46	11.34	0.31 - 0.49	0.42
	Duetz DX 160(3)	D	9	10.06 - 15.06	12.49	0.36 - 0.78	0.58
	JD 4020	D	1	-	10.66	-	0.32
Sprayer	Duetz DX 160(3)	D	9	6.50 - 9.06	7.42	0.21 - 0.42	0.29
(marker dye)			1	-	-	-	0.10
Fertilizer banding (anhydrous)	Duetz DX 160	D	5	13.68 - 16.64	15.15	1.22 - 2.70	1.80
	Duetz DX 160(3)	D	1	-	15.07	-	2.05
	Vers 835	D	1	-	-	-	2.16
Fertilizer spreader	Deutz DX 160(3)	D	1	-	7.48	-	0.54
	JD 4020	D	1	-	10.66	-	0.32
Swather SP	Vers 400	G	2	-	-	0.77 - 0.83	0.80
Combine	NH TR 85	D	8	22.23 - 34.04	26.98	4.00 - 5.68	4.72
(SP-straight cut)			2	-	-	5.10 - 5.39	5.25
(SP-pick up)			5	-	-	4.00 - 5.68	4.51
Heavy Truck (grain & misc. hauling)	GMC 3 T '78	G	2		3.8 mpg	1.91 - 1.95	1.93
Light Vehicles (general support)	GMC 1/2 T '73	G	2		10.0 mpg	0.63 - 1.21	0.92

Farm No. 30
NW Black Soil Zone

Acreage: 1340 Cultivated (Total 1920)
Cropped 1150, fallow 130, hay 60

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8430	D	14	25.95 - 35.96	31.04	1.40 - 2.00	1.66
	IH 1486	D	4	23.97 - 26.17	25.34	1.23 - 1.48	1.34
(secondary tillage)	JD 8430	D	5	27.73 - 32.06	30.30	1.17 - 2.39	1.72
Cultivator/spikes	JD 8430	D	4	25.95 - 33.00	30.79	1.64 - 2.39	2.01
Zero-till drill	IH 1466	D	2	16.67 - 16.95	16.84	1.42 - 1.83	1.56
	JD 8430	D	4	17.67 - 23.11	21.04	1.06 - 1.63	1.40
Sprayer	IH 1486	D	1	-	-	-	0.43
Fertilizer broadcast	IH 1466	D	2	13.20 - 14.60	14.00	0.51 - 0.53	0.52
Fertilizer banding (anhydrous)	JD 8430	D	1	-	32.15	-	1.67
Swather (pull)	JD 2130	D	1	5.30 - 5.82	5.56	0.51 - 0.71	0.61
Combine(SP-straight cut)	Gleaner L2	D	5	14.10 - 18.06	14.77	0.67 - 3.30	2.26
Heavy Trucks	IH 3 T	G	1		6.4 mpg		0.24
Light Trucks	GMC 1/2 T	G	-		19.8 mpg		n.r.
	GMC 3/4 T	G			11.8 mpg		

Farm No. 31
WC Dark Brown Soil Zone

Acreage: 2245 Cultivated (Total 2560)
Cropped 1980, fallow 265, hay 136

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4640	D	6	-	-	1.17 - 3.13	2.03
Discer (seeding)	JD 4640	D	4	-	-	1.10 - 3.75	1.90
Hoe drill	JD 4430	D	3	-	-	1.15 - 1.27	1.21
Airseeder	JD 4640	D	1	-	-	-	1.80
Harrow	JD 4430	D	4	-	-	0.59 - 0.92	0.69
Spray/Harrow	JD 4430	D	3	-	-	0.60 - 0.88	0.73
Sprayer	JD 4430	D	5	-	-	0.28 - 0.37	0.32
	Ford F250	G	2	-	-	-	0.58
Fertilizer broadcast	JD 4430	D	1	-	-	-	0.47
Rockpicker	Cockshutt 160	D	1	-	-	-	0.61
(seeded acreage)	JD 4430	D					
Swather (pull)	JD 4430	D	3	-	-	0.60 - 0.70	0.65
	JD 4240	D	4	-	-	0.61 - 1.09	0.77
Combine (SP-pickup)	IH 503	G	3	-	-	3.40 - 3.58	3.10
Heavy Trucks	Ford 3 T	G	1		5.7 mpg		0.97
(grain & misc. hauling)	GMC 2 T	G			7.4 mpg		
Light Vehicles	Ford 1/2 T	G			10.0 mpg		
(general support)	Ford 4x4 1/2 T	G	-		8.1 mpg		n.r.
	Ford Crew Cab	G			7.3 mpg		
	Mazda B1800	G			27.6 mpg		

Farm No. 32
EC Dark Brown Soil Zone

Acreage: 860 Cultivated (Total 960)
Cropped 836, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4440	D	3	21.61 - 22.38	21.08	1.86 - 2.35	2.08
Rodweeder (multiplex)	JD 4440	D	1	-	24.32	-	1.96
Discer (seeding)	JD 4440	D	12	15.36 - 19.73	16.80	1.65 - 1.88	1.77
Seedrite	JD 4440	D	1	-	20.63	-	2.10
Hoedrill	IH 706	D	1	-	8.68	-	1.33
Airseeder	JD 4440	D	1	-	17.16	-	1.77
Harrows	JD 4440	D	2	14.24 - 16.97	15.61	0.65 - 0.75	0.70
	IH 706	D	8	9.19 - 11.67	10.32	0.44 - 0.58	0.51
Packer	IH 706	D	1	-	7.86	-	0.77
Sprayer	JD 4440	D	3	10.49 - 11.03	10.82	0.38 - 0.39	0.38
Fertilizer banding (anhydrous - spring)	JD 4440	D	8	21.87 - 27.93	23.85	1.44 - 2.09	1.80
Rockpicker (seeded acreage)	IH 706	D	2	-	-	0.08 - 0.38	0.24
Swather (pull)	JD 4440	D	1	-	10.18	-	0.88
	IH 706	D	4	7.41 - 8.26	7.83	0.56 - 0.68	0.61
Combines (SP-pick up)	IH 1440	D	6	14.11 - 18.21	16.07	2.38 - 4.45	3.09
(SP-straight cut)	IH 1440	D	4	18.90 - 20.18	19.49	1.76 - 2.71	2.23
(pull-pick up)	JD 4440	D	3	13.57 - 15.56	14.77	2.22 - 2.49	2.38
Heavy Trucks (grain & misc hauling)	GMC 2 T	G	2		7.3 mpg		1.56
Light Vehicles	Chev 1/2 T	G			18.7 mpg		
(general support)	Chev '77	G	2		23.6 mpg		2.24
	Volvo '72	G			30.3 mpg		

Farm No. 33
SE Black Soil Zone

Acreage: 1705 Cultivated (Total 2560)
Cropped 1485, fallow 220

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	IH 4568	D	10	31.24 - 60.23	44.17	2.20 - 3.54	2.83
	IH 1568	D	1	-	29.90	-	2.42
Airseeder	IH 4568	D	6	25.00 - 54.40	41.98	2.43 - 3.70	2.90
Harrow-Packer	IH 1568	D	2	-	-	1.31 - 1.42	1.37
Spray/Harrow-Packer	IH 1568	D	1	-	-	-	1.78
Sprayer	IH 1568	D	1	-	24.77	-	2.15
Rockpicker (seeded acreage)	Case 930	D	1	-	-	-	0.45
Combine (SP-pickup)	MF 760	D	3	21.21 - 33.63	28.04	2.42 - 4.29	2.81
Heavy Trucks (grain & misc. hauling)	Ford 600 4 T	G	1		6.4 - 8.5 mpg		1.71
Light Vehicles	Chev 3/4 T	G	1		7.3 mpg		2.91
(general support)	Chev 3/4 T	G			14.7 mpg		

Farm No. 34
NE Black Soil Zone

Acreage: 900 Cultivated (Total 960)
Cropped 830, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Plow	Vers 836	D	1	-	-	-	5.89
Cultivators (primary)	Case 1370	D	1	-	25.75	-	1.39
	Vers 836	D	2	-	-	2.30 - 2.44	2.37
Disc (tandem)	Vers 836	D	1	-	23.04	-	2.53
Zero-till drill (hoe)	Case 1370	D	10	17.76 21.65	19.79	1.60 - 3.05	2.19
Harrows	Vers 150	D	1	-	-	-	0.65
	Vers 836	D	1	-	19.02	-	0.63
	Case 1370	D	2	16.94 - 21.0	18.88	0.56 - 0.66	0.61
Sprayer	Vers 150	D	3	4.43 - 6.74	5.60	0.37 - 0.46	0.41
Fertilizer banding (anhydrous - fall)	Case 1370	D	1	-	-	-	3.79
	Case 4490	D					
Swather (SP)	Vers 400	G	7	-	-	1.14 - 2.10	1.44
(pull)	Vers 150	D	3	6.51 - 7.81	7.24	0.65 - 1.07	0.79
Combine (SP-pickup)	Gleaner L2	D	9	-	-	2.18 - 4.00	3.15
(pickup tough conditions)			3	-		5.00 - 5.49	5.29
Heavy Trucks	Chev 3 T '74	G	2		7.6 mpg		1.59
(grain & misc. hauling)	Chev 3 T '74	G			7.6 mpg		
Light Vehicles	Chev 1/2 T '80	G	1		16.8 mpg		3.19
(general support)	Chev 1/2 T '85	G			18.0 mpg		

Farm No. 35
NW Black Soil Zone

Acreage: 2563 Cultivated (Total 4000)
Cropped 2563, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8850	D	3	-	36.96	1.60 - 1.62	1.61
Airseeders	JD 8850	D	3	30.32 - 34.52	32.42	1.82 - 2.18	1.94
Zero-till drill (hoe)	JD 8850	D	3	20.81 - 24.81	23.60	2.09 - 2.46	2.32
	JD 8430	D	3	20.81 - 25.05	23.63	1.80 - 2.20	2.03
Harrow Packer	JD 8430	D	2	21.11 - 21.44	21.28	0.60 - 0.66	0.63
Sprayer	JD 4240	D	1	-	-	-	0.22
Rock Picker (seeded acreage)	JD 4240	D		9.59 - 11.82	-	-	0.31
Swather (pull)	JD 4240	D	2	11.30 - 11.59	11.45	0.77 - 0.81	0.79
Combine (SP-pickup)	JD 8820 (2)	D	2	29.06 - 31.30	30.18	1.51 - 1.54	1.53
(SP-straight cut)	JD 8820 (2)	D	2	27.05 - 33.00	30.03	1.28 - 1.33	1.31
Heavy Trucks	Ford LN 800	G	1		5.4 mpg		0.69
(grain & misc. hauling)	Chev 3T	G			5.4 mpg		
Light Vehicles (general support)	Chev 1/2 T	D	1		20.0 mpg		0.65

Farm No. 36
NE Black Soil Zone

Acreage: 905 Cultivated (Total 1040)
Cropped 905, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Deutz DX 160	D	25	11.08 - 21.00	16.99	1.33 - 2.50	1.83
(spring tillage)	Deutz DX 160	D	6	11.08 - 19.87	14.40	1.33 - 1.86	1.61
(fall tillage)	Deutz DX 160	D	19	15.18 - 21.00	17.81	1.50 - 2.50	1.89
Seedrite	Deutz DX 160	D	15	11.07 - 21.56	16.72	1.98 - 3.04	2.39
Harrows	Deutz DX 160	D	2	13.90 - 15.20	14.55	0.58 - 0.72	0.65
	Deutz 7206	D	17	5.67 - 8.50	6.61	0.21 - 0.33	0.27
Sprayer	Duetz 7206	D	4	3.04 - 6.55	4.64	0.12 - 0.17	0.14
Fertilizer banding							
(anhydrous-spring)	Duetz DX 160	D	1	-	16.43	-	1.59
(anhydrous-fall)	Duetz DX 160	D	11	16.30 - 26.33	18.81	1.63 - 2.72	2.02
Rockpicker							
(seeded acres)	Duetz 7206	D	2	-	4.64	0.07 - 0.40	0.24
Swather (pull)	Duetz 7206	D	11	3.67 - 7.17	4.97	0.34 - 0.58	0.47
Combine (SP-pickup)	MF 860	D	11	16.84 - 24.21	20.28	2.30 - 4.63	3.39
Heavy Trucks	Dodge 600 4 T	G			3.7 mpg		
(grain & misc. hauling)	Dodge 3 T '46	G	2		5.2 mpg		2.64
	Dodge 1/2 T '59	G			-		
	Dodge 300 1 T	G			9.5 mpg		

Farm No. 37
NW Black Soil Zone

Acreage: 2160 Cultivated (Total 2960)
Cropped 1820, fallow 340, pasture 600

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Vers. 500	D	18	22.67 - 37.74	30.05	1.00 - 3.33	2.03
	JD 4640	D	2	-	23.58	2.14 - 2.29	2.22
(secondary tillage)	Vers. 500	D	19	19.05 - 37.74	28.11	1.11 - 3.64	1.89
Cultivator/Spikes	Vers. 500	D	3	27.03 - 28.99	27.69	1.28 - 1.48	1.40
Cultivator/Packers	Vers. 500	D	13	20.00 - 36.92	29.50	1.11 - 2.40	1.75
Rodweeder	Vers. 500	D	1	-	27.55	-	1.10
Press drill (d.d.)	Case 2290	D	13	9.04 - 15.71	14.22	0.82 - 1.40	1.11
Harrows	Case 2290	D	6	12.73 - 16.00	13.81	0.50 - 0.71	0.59
	Case 930	D	3	10.21 - 13.89	12.03	0.37 - 0.52	0.47
Harrow Packer	White 2-155	D	4	6.86 - 17.37	12.04	0.71 - 0.95	0.80
Harrow Valmar Spreader	Case 2290	D	2	13.20 - 15.85	15.58	0.72 - 0.83	0.78
Fertilizer banding (anhydrous)	Vers. 500	D	5	16.92 - 40.00	26.29	0.90 - 1.50	1.20
	Case 2290	D	3	13.51 - 20.22	17.91	0.88 - 1.50	1.27
Sprayer	Case 2290	D	6	9.38 - 11.74	10.75	0.41 - 0.42	0.42
Rockpicker	Case 1212	D	1				0.23
(seeded acreage)	Case 2290	D					
Swather (SP-silage)	Vers. 400	G	1	-	-	-	1.93
(SP-grain)	Vers. 400	G	7	-	-	0.22 - 2.33	1.12
Swather (pull)	Case 2290	D	9	9.47 - 11.99	10.97	0.75 - 1.33	0.93
	Case 1212	D	2	2.57 - 3.40	2.99	0.48 - 1.23	0.86
Combines (pull-pickup)	Vers. 500	D	22	15.29 - 32.71	24.18	1.39 - 5.00	3.28
	JD 4640	D	2	15.09 - 18.26	16.68	3.85 - 4.00	3.93
	JD 4850	D	4	26.21 - 26.96	26.14	2.54 - 3.00	2.68
Heavy Truck	IH 1824 3 T	G	1		4.8 mpg		0.85
(grain & misc. hauling)	IH 1600 3 T	G			5.8 mpg		
Light Trucks	GMC 1/2 T '79	G			15.7 mpg		
(general support)	GMC 1/2 T '81	G	1		12.3 mpg		1.49
	IH 1/2 T '68	G			-		

Farm No. 38
SE Dark Brown Soil Zone

Acreage: 1635 Cultivated (Total 2240)
Cropped 1295, fallow 340

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8430	D	2	31.02 - 35.42	33.22	1.98 - 2.86	2.42
	JD 4430	D	1	-	18.41	-	1.73
(secondary tillage)	JD 8430	D	2	-	-	1.63 - 2.13	1.88
Airseeder/Packers	JD 8430	D	10	26.58 - 30.40	28.24	1.56 - 2.91	2.17
Harrows	JD 4430	D	3	12.45 - 13.07	12.76	0.49 - 0.83	0.63
Sprayer	JD 4430	D	5	9.61 - 13.26	11.28	0.27 - 0.60	0.36
Chemical Applicator	JD 4430	D	1	-	9.45	-	1.38
Rockpicker (seeded acreage)	JD 4020	D	1	-	6.36		0.06
Swather (pull)	JD 4430	D	1	-	8.91	-	0.76
Combine (SP straight cut)	JD 7700	D	8	11.62 - 25.76	18.86	2.08 - 4.88	3.36
(pull-pickup)	JD 8430	D	1	-	20.36	-	3.39
Heavy Trucks (grain & misc. hauling)	Fargo 600	G			3. mpg		n.r.
Light Vehicles	GMC 3/4 T	G	1		12.9 mpg		2.01
(general support)	Chev Wagon '80	G			19.4 mpg		

Farm No. 39
SC Dark Brown Soil Zone

Acreage: 3000 Cultivated (Total 3200)
Cropped 1500, fallow 1500

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Vers. 895	D	7	39.60 - 52.00	46.28	1.29 - 2.20	1.98
Discer (seeding)	Vers. 895	D	2	31.68 - 31.91	31.80	1.75 - 1.99	1.87
Harrow Packer	MF 1805	D	1	-	27.00	-	0.70
Spray/Harrow	Case 1570	D	3	21.97 - 26.31	24.15	0.47 - 0.63	0.56
Sprayer	Chev 3/4T	G	2	-	-	0.21 - 0.23	0.22
Swathers (pull)	JD 4020	D	3	-	-	0.34 - 0.66	0.51
Combines (SP-pickup)	IH 915	D	2	-	30.74	1.79 - 2.00	1.90
	MF 750	D					

Farm No. 40
SW Brown Soil Zone

Acreage: 2688 Cultivated (Total 5120)
Cropped 1625, fallow 963

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	AC 8550	D	9	38.80 - 50.30	45.37	1.99 - 4.26	2.60
	JD 4440	D	1	-	26.38	-	0.82
(secondary tillage)	AC 8550	D	6	35.85 - 43.81	38.15	2.07 - 3.30	2.54
Rodweeder	JD 4440	D	2	16.98 - 18.81	17.96	1.06 - 1.58	1.32
Discer (seeding)	JD 4440	D	3	18.30 - 20.10	19.40	2.04 - 2.26	2.12
Airseeder	AC 8550	D	17	27.30 - 54.90	44.20	1.76 - 4.34	3.00
Fertilizer Spreader	JD 4440	D	1	-	6.46	-	0.26
Harrow Packer	AC 8550	D	5	23.65 - 32.68	29.31	0.38 - 1.50	1.11
	JD 4440	D	2	21.54 - 27.23	24.39	0.56 - 0.80	0.68
Sprayer	JD 4440	D	10	9.42 - 27.20	15.77	0.32 - 0.90	0.46
Rockpicker	JD 4440	D	2	11.36 - 11.98	11.67		
(seeded acreage)	Ford 6600	D	3	5.19 - 5.71	5.52	-	0.46
Swather (SP)	Vers. 4440	G	8	2.20 - 2.67	2.50	0.27 - 0.36	0.25
(pull)	JD 4440	D	1	-	-	-	0.50
Combines (SP-pickup)	MF 860	D	13	15.00 - 19.50	16.97	0.89 - 2.67	1.43
	CCIL 950	D	2	-	-	1.34 - 1.43	1.39
Heavy Trucks	Chev 3 T '65	G	2		5.9 mpg		0.41
(grain & misc. hauling)	Chev 3 T '76	G			3.9 mpg		
Light Vehicles	Dodge 4x4 '82	G			15.9 mpg		
(general support)	Dodge 1/2 T '78	G	1		10.8 mpg		3.23
	Ford Van '79				13.1 mpg		
	Ford Van '86				16.5 mpg		

Farm No. 41
SE Black Soil Zone

Acreage: 1001 Cultivated (Total 1280)
Cropped 913, fallow 88

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Hoedrill	JD 4440	D	6	13.79-15.51	14.65	2.08-2.74	2.34
Sprayer	JD 4010	D	11	-	-	0.45-0.61	0.49

Farm No. 42
SC Dark Brown Soil Zone

Acreage: 1675 Cultivated (Total 2160)
Cropped 1675, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (secondary tillage)	IH 1066	D	1	-	13.97	-	1.16
Disc (tanden-breaking)	IH 1066	D	2	-	-	2.64 - 3.56	3.10
Zero-till drill (hoe, banding)	IH 1066	D	9	10.75 - 16.22	13.69	1.66 - 2.84	2.34
Sprayer	IH 966	D	11	8.67 - 11.65	9.99	0.31 - 0.48	0.38
Rockpicker (seeded acreage)	IH 966 IH 504	D G	2	-	11.09	0.03 - 0.31	0.17
Swather (pull)	JD 3140	D	1	-	-	-	0.79
Combine (SP-straight cut)	Gleaner M2	D	9	10.98 - 16.32	14.14	1.37 - 1.87	1.65
Heavy Trucks (grain & misc. hauling)	Dodge D600 3 T	G	2		5.6 mpg		0.98
Light Vehicles (general support)	GMC 3/4 T '78 Volkswagon	D D	2		11.0 mpg 48.0 mpg		0.98

Farm No. 43
NC Black Soil Zone

Acreage: 1885 Cultivated (Total 2080)
Cropped 1885, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Ford FW40	D	6	44.59 - 56.52	50.14	1.72 - 2.32	2.06
(secondary tillage)	Ford FW40	D	2	47.50 - 53.57	50.61	1.58 - 1.88	1.73
Disc (tandem)	IH 4166	D	3	22.19 - 24.80	23.82	1.41 - 1.59	1.50
Press Drill (d.d.)	IH 4166	D	6	16.40 - 19.14	17.86	0.94 - 1.15	1.08
Harrows	JD 4430	D	11	16.79 - 20.57	18.20	0.25 - 0.60	0.45
Sprayer	IH 460	G	1	-	14.60	-	0.50
Swather (SP)	IH 210	G	6	7.08 - 8.91	8.12	0.38 - 0.98	0.67
(pull)	JD 4430	D	2	22.04 - 28.50	12.33	0.73 - 1.07	0.90
Combine (SP-pickup)	MF 760	D	2	-	22.65	1.97 - 2.67	2.33
Heavy Trucks (grain & misc. hauling)	Ford 800 Ford 700	G G	-		11.8 mpg 10.9 mpg		n.r.
Light Trucks (general support)	GMC 1 1/2 T GMC 3/4 T GMC 1/2 T	G G G	-		4.9 mpg 13.5 mpg 12.3 mpg		n.r.

Farm No. 44
WC Dark Brown Soil Zone

Acreage: 1080 Cultivated (Total 1120)
Cropped 770, fallow 310

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4630	D	5	19.75 - 24.68	22.39	2.43 - 2.73	2.20
(secondary tillage)	JD 4630	D	4	16.98 - 21.87	19.37	1.50 - 2.18	1.83
Discer (seeding)	JD 4630	D	6	16.26 - 19.93	18.01	1.48 - 2.98	2.02
Harrow Packer	JD 4020	D	12	10.00 - 14.54	11.72	0.81 - 1.25	0.99
Sprayer	JD 4020	D	4	7.46 - 8.39	8.03	0.28 - 0.37	0.33
Swather (pull)	JD 4020	D	8	7.74 - 9.00	8.20	0.53 - 1.37	0.79
Combine (pull-pickup)	JD 4630	D	6	10.42 - 13.11	12.22	1.25 - 5.18	3.13
(wheat)			2	11.48 - 13.11	12.29	1.64 - 2.46	2.05
(flax)			2	10.42 - 12.97	11.94	5.09 - 5.18	5.13
Heavy Trucks	Ford 5 T '75	D	2				1.56
(grain & misc. hauling)	Ford 3 T '68	G					
Light Vehicles (general support)	Ford 1/2 T '77		-			17.5 mpg	n.r.

Farm No. 45
SC Dark Brown Soil Zone

Acreage: 3656 Cultivated (Total 3680)
Cropped 3656, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Case 4494	D	3	-	-	1.80 - 2.60	2.06
(secondary tillage)	Case 4494	D	3	-	-	1.28 - 1.46	1.37
Rodweeder	Case 2290	D	3	-	-	1.06 - 1.23	1.11
Discer (seeding)	Case 2290	D	3	-	-	1.45 - 1.70	1.60
Press drill (d.d.)	Case 970	D	3	-	-	1.23 - 1.34	1.29
Harrows/sprayer	Case 2290	D	3	-	-	1.06 - 1.33	1.25
Sprayer	Case 2290	D	3	-	-	0.80 - 1.20	0.83
Fertilizer banding (anhydrous)	Case 2290	D	3	-	-	1.43 - 1.80	1.67
Rockpicker (seeded acreage	Case 970	D	3	-	-	1.03 - 1.19	1.10
Swather (SP)	Vers	G	3	-	-	1.26 - 1.70	1.47
(pull)	Case 2290	D	3	-	-	1.30 - 1.40	1.36
Combine (pull-pickup)	Case 4490	D	3	-	-	1.03 - 1.19	1.10

Farm No. 46
WC Dark Brown Soil Zone

Acreage: 3480 Cultivated (Total 3960)
cropped 2415, fallow 1065

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4640	D	2	-	-	1.66 - 1.69	1.68
(secondary tillage)	JD 8440	D	5	-	-	1.65 - 1.98	1.82
Airseeder	JD 8440	D	8	17.39 - 32.41	27.15	1.11 - 1.92	1.57
Harrow Packer	JD 4640	D	3	-	-	0.99 - 1.07	1.03
Fertilizer banding	JD 8440	D	3	-	-	1.95 - 1.96	1.96
Combine(SP-straight cut)	Claus 96	D	8	-	-	1.37 - 2.25	1.92
Heavy Trucks (grain & misc. hauling)	IH Tandem	D	-		5.7 mpg		n.r
Light Vehicles	Ford 150 1/2 T	G	-		16.6 mpg		n.r
(general support)	Ford 250 3/4 T	G			7.1 mpg		

Farm No. 47
EC Dark Brown Soil Zone

Acreage: 3584 Cultivated (Total 4800)
Cropped 3169, fallow 415

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	IH 4386	D	8	21.62 - 39.48	29.15	1.76 - 3.25	2.55
	Ford TW20(1)	D	2	15.35 - 16.63	15.99	2.13 - 2.14	2.14
	Ford TW20(2)	D	8	12.90 - 21.65	16.85	1.39 - 2.63	2.13
(secondary tillage)	IH 4386	D	1	-	29.21	-	2.36
	Ford TW20(1)	D	4	14.05 - 23.20	16.84	1.78 - 2.24	1.96
	Ford TW20(2)	D	2	9.681 - 8.55	14.12	1.31 - 1.64	1.48
Disc (tandem)	Ford TW20(1)	D	1	-	11.58	-	1.17
	Ford TW20(2)	D	4	16.89 - 18.97	18.05	1.95 - 2.73	2.41
Rodweeder	IH 4386	D	5	22.23 - 27.12	24.37	1.42 - 2.09	1.67
	Ford TW20(1)	D	3	13.86 - 16.26	15.14	0.45 - 1.22	0.72
	Ford TW20(2)	D	2	13.07 - 18.04	15.87	1.01 - 1.17	1.09
Airseeder	IH 4386	D	4	16.20 - 27.03	21.46	1.67 - 2.41	2.03
	Ford TW20(1)	D	5	11.33 - 16.89	14.21	1.50 - 2.12	1.82
	Ford TW20(2)	D	2	14.47 - 15.15	14.79	1.92 - 2.37	1.97
Press drill (d.d.)	Ford TW20(1)	D	10	8.01 - 14.66	11.12	0.89 - 1.68	1.19
	Ford TW20(2)	D	1	-	9.28	-	1.33
Harrows	Ford TW20(2)	D	1	-	10.74	-	0.29
Harrow/sprayer	Ford 7600	D	3	6.98 - 12.87	9.93	0.45 - 0.87	0.71
Sprayer	Ford 7600	D	2	5.13 - 8.11	7.28	0.40 - 0.45	0.42
	Ford 6600	D	9	3.88 - 4.04	3.96	0.20 - 0.35	0.29
Fertilizer banding (dry)	IH 4386	D	1	-	11.81	-	1.42
	Ford TW20(1)	D	2	12.25 - 13.67	12.96	1.38 - 1.71	1.55
	Ford TW20(2)	D	2	10.23 - 10.24	10.24	1.08 - 1.33	1.21
(anhydrous)	IH 4386	D	2	19.23 - 20.88	20.06	3.24 - 4.62	3.93
Rockpicker	Ford 6600	D	7	4.10 - 5.56	4.96	-	0.33
(seeded acreage)	Ford 7600	D	7	4.76 - 7.00	6.02	-	
Swather (SP)	Renn	G	5	9.09 - 11.36	10.07	0.85 - 1.65	1.18
	CCIL	G	1	-	9.09	-	0.74
	IH 4000	G	3	11.25- 11.56	11.37	0.96 - 1.23	0.97
	Vers. 4400	G	1	-	11.63	-	1.18
(pull & SP)	Renn	G	7	9.09 - 11.38	9.95		
	CCIL	G	2	9.09 - 12.34	10.72		
	Ford 7600	D	3	3.85 - 6.71	4.84	-	1.17
	Ford 6600	D	4	5.00 - 5.03	5.01		
	Ford 800	D	2	10.10 - 10.61	10.36		
Combines (SP-straight)	Ford 642(1)	D	1	-	9.66	-	2.27
	Ford 642(1)	D		11.17 - 12.73	11.95		
	Ford 642(2)	D	2	7.42 - 8.99	8.21	2.59 - 4.17	3.38
	White 7600	G		-	33.60		
(SP-pickup)	Ford 642(1)	D	1	-	12.59	-	2.52
	Ford 642(1)	D	3	8.81 - 12.79	11.10		
	Ford 642(2)	D		10.00 - 11.39	10.70	1.21 - 6.04	3.17
	White 7600	G		-	27.27		
Combine (pull-pickup)	Ford TW20(2)	D	1	-	10.00	-	3.83
(SP & pull-pickup)	Ford 642(1)	D		9.11 - 12.52	10.01		
	White 7600	G	9	27.27 - 33.67	28.83	1.49 - 7.36	3.69
	Ford TW20(2)	D		6.94 - 13.39	10.97		
	Ford TW20(1)	D		10.52 - 12.67	11.60		
	Ford 642(1)	D		9.78 - 10.62	10.31		
	Ford 642(2)	D		11.01 - 16.50	12.87		
	White 7600	G	3	33.54 - 33.60	33.58	2.656.48	3.99
	Ford TW20(1)	D		8.24 - 12.92	10.58		
	Ford TW20(2)	D		7.90 - 13.57	10.74		

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Farm No. 47 continued

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Combines	Claas 116	D		-	22.86		
(SP & pull-pickup) con't	White 7600	G	1	-	33.60	-	6.23
	Ford TW20(2)	G		-	7.90		
	White 7600	G	2	27.27 - 28.27	27.77	4.61 - 5.34	4.98
	Ford TW20(2)	D		11.52 - 12.11	11.82		
Heavy Trucks	Frieghtliner(1)	D			-		
(grain & misc. hauling)	Frieghtliner(2)	D	1		1.7 mpg		2.58
	Ford 3 T '75	G			6.1 mpg		
	Ford 3 T '79	G			6.1 mpg		
Light Vehicles	Ford 3/4 T	G			5.9 mpg		
(general support)	Ford 1/2 T	G	1		13.4 mpg		2.01
	Ford Ranchero	G			8.4 mpg		
	Ford Van	G			9.9 mpg		

Farm No. 48
SW Brown Soil Zone

Acreage: 1540 Cultivated (Total 1600)
Cropped 1240, fallow 300

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Case 2290	D	2	-	-	2.10 - 2.13	2.12
	Case 1070	D	6	20.63 - 26.46	22.47	1.63 - 2.39	1.95
(secondary tillage)	Case 1070	D	2	15.35 - 18.89	17.22		-
Discer (seeding)	Case 1070	D	6	15.48 - 19.58	17.00	1.55 - 2.42	1.99
Hoedrill	Case 1070	D	6	15.38 - 19.02	17.75	1.65 - 2.45	1.93
Harrow Packer	Case 1070	D	2	15.90 - 17.84	16.62	0.82 - 1.09	0.96
Fertilizer broadcast	Case 1070	D	1	-	10.09	-	0.29
Sprayer	Case 1070	D	5	7.93 - 12.47	10.04	0.21 - 0.56	0.36
Swather (pull)	Case 2290	D	1	-	9.06	-	0.85
	Case 1070	D	1	-	12.64	-	0.58
Combine (SP-pickup)	MF 750	D	2	22.40 - 22.87	22.64	1.68 - 1.72	1.70
(SP-straight cut)	MF 750	D	7	16.13 - 21.14	18.59	1.31 - 2.32	1.83

Farm No. 49
NC Dark Brown Soil Zone

Acreage: 1250 Cultivated (Total 1270)
Cropped 1250, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Vers. 835	D	1	-	13.27	-	1.88
Airseeder	Vers. 835	D	8	29.97 - 44.30	36.97	1.11 - 2.33	1.64
Harrow	Case 1370	D	1	-	-	-	0.86
Harrow Packer	Case 1370	D	8	-	-	0.50 - 0.73	0.61
Sprayer	JD 1830	D	4	-	-	0.32 - 0.33	0.33
Swather (SP)	Vers. 4400	G	5	-	-	1.00 - 1.03	1.01
(pull)	Vers. 276	D	2	-	-	0.30 - 0.72	0.91
Combine (SP-pickup)	MF 850	D	8	15.71 - 31.48	25.13	1.41 - 2.80	1.86
Heavy Trucks	Chev 3 T	G	2				1.33
(grain & misc. hauling)	Ford 2 T	G			10.9 mpg		
Light Vehicles (general support)	Ford 1/2 T '81	G			11.5 mpg		

Farm No. 50
WC Brown Soil Zone

Acreage: 940 Cultivated (Total 960)
Cropped 695, fallow 245

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	IH 5088	D	5	24.20 - 28.20	23.04	1.34 - 1.84	1.58
(secondary tillage)	IH 5088	D	5	20.00 - 25.80	22.79	0.98 - 1.92	1.44
(herbicide incorp.)	IH 5088	D	2	18.62 - 19.00	18.87	1.18 - 1.34	1.26
Rodweeder	IH 5088	D	8	14.71 - 22.36	20.58	0.64 - 1.06	0.95
Press drill (d.d.)	IH 5088	D	5	12.00 - 17.00	14.76	0.82 - 1.55	1.11
Harrow	IH 5088	D	4	17.20 - 21.30	18.56	0.49 - 0.76	0.62
Fertilizer banding (anhydrous)		D	3	23.30 - 24.50	23.38	1.74 - 1.96	1.82
Sprayer	Oliver 1800	D	1	-	-	-	0.29
	IH5088	D	1	-	-	-	0.10
Swather (pull)	IH 5088	D	3	11.40 - 15.75	14.08	0.84 - 1.02	0.93
Combine (pull-pickup)	IH 5088	D	6	14.63 - 30.22	18.97	1.46 - 2.72	1.88
Heavy Trucks	IH 3 T	G	1				0.22
(grain & misc. hauling)	Chev 1 T	G					
Light Vehicles (general support)	Chev 1/2 T	G	-		14.9 mpg		n.r.

Farm No. 51
SE Black Soil Zone

Acreage: 802 Cultivated (Total 1440)
Cropped 708, fallow 94

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 4630	D	8	14.14 - 23.24	19.07	1.52 - 2.35	1.93
(secondary tillage)	JD 4630	D	2	16.20 - 17.04	16.62	1.74 - 2.32	2.03
(breaking)	JD 4630	D	2	23.23 - 31.56	27.40	3.49 - 3.63	3.56
Seedrite	JD 4630	D	7	15.58 - 18.89	17.53	2.40 - 3.17	2.98
Discer (seeding)	JD 4230	D	1	-	11.09	-	2.60
Harrows	JD 4630	D	3	13.64 - 15.58	14.91	0.63 - 0.78	0.72
	JD 4230	D	6	9.09 - 15.62	13.11	0.53 - 0.90	0.68
Fertilizer banding (anhydrous)	JD 4630	D	2	27.37 - 27.57	27.47	2.59 - 2.65	2.62
Sprayer	JD 4230	D	6	7.79 - 10.06	8.97	0.38 - 0.68	0.45
Swather (pull)	JD 4230	D	5	7.42 - 8.50	7.78	0.91 - 1.73	1.49
Combine (pull-pickup)	JD 4630	D	6	11.09 - 14.52	13.30	2.96 - 5.48	4.11

Farm No. 54
Brown Soil Zone (Alberta)

Acreage: 3000 Cultivated (Total 4000)

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Vers. 895	D	14	28.93 - 64.94	46.39	1.84 - 4.89	2.92
Disc (tandem)	JD 4640	D	1	-	26.00	-	3.10
Rodweeder	JD 4640	D	9	13.56 - 27.39	20.99	0.88 - 1.89	1.18
	Vers. 895	D	1	-	26.86	-	1.57
Hoedrill	JD 4640	D	3	14.62 - 20.90	18.27	1.61 - 2.14	1.83
Discer (seeding)	Vers. 895	D	6	13.54 - 36.25	26.76	1.16 - 1.83	1.53
Harrows	JD 4640	D	10	18.82 - 25.83	21.61	0.58 - 1.37	0.94
	MF 285	D	3	13.49 - 21.20	17.35	0.38 - 0.76	0.55
	Vers. 895	D	2	30.25 - 33.33	31.79	0.73 - 1.01	0.87
Fertilizer banding (dry)	Vers. 895	D	12	26.88 - 47.87	37.92	1.72 - 3.75	2.54
Sprayer	JD 4640	D	5	14.46 - 16.00	15.37	0.40 - 0.63	0.51
	MF 285	D	2	6.04 - 7.64	6.84	0.20 - 0.28	0.24
Swather (pull)	JD 4640	D	4	12.92 - 15.27	14.40	0.58 - 1.23	0.83
Combine (SP-pickup)	MF 760	D	10	5.231 - 5.61	11.84	0.66 - 3.43	1.51
(SP-straight cut)	MF 760	D	6	-	-	1.56 - 2.00	1.81
Heavy Trucks	Mack '78	D			4.7 mpg		
(grain & misc. hauling)	Kenworth '77	D	-		4.3 mpg		n.r.
	Dodge '70	G			2.9 mpg		
Light Vehicles	Chev 1/2 T	D	-		16.0 mpg		n.r.
(general support)	Chev 1/2 T	D			12.9 mpg		

Farm No. 55
SE Black Soil Zone

Acreage: 2220 Cultivated (Total 2560)
Cropped 1870, fallow 280, hay 70

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8450	D	7	31.80 - 41.90	34.30	1.68 - 2.63	2.08
(spikingfall)	JD 8450	D	8	33.70 - 46.00	38.70	1.52 - 3.23	2.44
Hoedrill	IH 3788	D	8	18.60 - 30.20	25.30	1.56 - 2.29	1.86
Harrow/spray	IH 986	D	1	-	21.10	-	0.61
Swather SP	IH 5000	D	3	15.60 - 18.00	16.50	1.50 - 2.10	1.89
Combine (SP-pickup)	JD 7700	D	3	34.50 - 37.60	35.70	4.17 - 5.31	4.62
(SP-straight cut)	JD 7700	D	5	38.20 - 43.00	40.80	2.55 - 4.30	3.14
Heavy Trucks	GMC 6500 4 T	G	1		8.0 mpg		2.11
(grain & misc hauling)	Ford 750 8 T	G			4.0 mpg		
Light Vehicles	GMC 1/2 T '81	G			15.0 mpg		
(general support)	GMC 1/2 T '82	G	1		-		5.14
	GMC 1/4 T '84	G			23.0 mpg		

Farm No. 56
EC Dark Brown Soil Zone

Acreage: 680 Cultivated (Total 960)
Cropped 590, fallow 90, pasture 205

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivator (primary)	JD 4440	D	12	22.00 - 32.57	28.59	1.83 - 2.71	2.23
(secondary tillage)	JD 4440	D	5	17.00 - 25.83	20.72	1.36 - 2.09	1.17
(spiking fall)	JD 4440	D	1	-	27.60	-	3.00
Press drill (d.d)	JD 4440	D	9	14.00 - 18.57	15.74	1.17 - 1.63	1.39
Harrows	JD 4440	D	13	16.00 - 23.20	19.98	0.50 - 0.77	0.62
	JD 3020	D	4	8.00 - 13.25	10.47	0.27 - 0.53	0.41
Fertilizer banding (anhydrous)	JD 4440	D	4	26.89 - 30.00	28.69	2.29 - 2.85	2.47
Chemical Applicator	JD 4440	D	2	9.00 - 12.50	10.75	0.36 - 0.50	0.43
Sprayer	JD 3020	D	1	-	6.23	-	0.21
Swather (pull)	JD 3020	D	12	5.40 - 8.38	7.10	0.60 - 1.09	0.82
Combine (pull-pickup)	JD 4440	D	7	15.70 - 9.77	17.96	3.14 - 6.15	4.12
(wheat)			4	17.67 - 18.92	18.52	3.78 - 6.15	4.70
(barley)			2	16.20 - 19.77	17.99	3.24 - 3.67	3.46
(oats)			1	-	15.70	-	3.14
Heavy Trucks (grain & misc. hauling)	GMC 3T	G	1		7.0 mpg		2.45
Light Vehicles	GMC 1/2 T '78	G	1		21.8 mpg		3.34
(general support)	VW Rabbit	D			41.4 mpg		

Farm No. 57
WC Brown Soil Zone

Acreage: 1440 Cultivated (Total 1440)
Cropped 720, fallow 720

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	White 2-180	D	3	18.12 - 22.46	20.08	2.06 - 2.99	2.63
Discers (seeding)	White 2-180	D	4	22.00 - 25.46	23.82	1.68 - 2.21	1.88
Rodweeder	White 2-180	D	4	16.55 - 26.79	21.62	1.21 - 1.78	1.54
	IH 1466	D	1				1.44
Combine (pull-pickup)	White 2-180	D	7	15.00 - 25.25	22.27	2.14 - 3.45	2.76
Swather (pull)	Deutz 8005	D	3	5.67 - 5.83	5.75	0.44 - 0.60	0.49
	JD 1120	D	1	-	-	-	0.43
Heavy Trucks (grain & misc. hauling)	IH 3 T	G	1		4.4 mpg		1.05
Light Vehicles	Ford 3/4 T	G			8.7 mpg		
(general support)	Toyota Car	G	-		34.1 mpg		n.r.
	Volvo Car	G			25.1 mpg		

Farm No. 58
NW Black Soil Zone

Acreage: 1674 Cultivated (Total 1744)
Cropped 1570, fallow 104, pasture/hay 70

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8440	D	21	20.12 - 40.70	32.33	1.00 - 2.37	1.65
(secondary tillage)	JD 8440	D	3	16.83 - 34.09	27.51	1.20 - 2.06	1.72
Airseeder	JD 8440	D	12	27.65 - 35.22	29.97	1.59 - 2.30	1.88
Press Drills	JD 4450	D	5	11.45 - 19.76	16.89	0.97 - 1.23	1.12
Harrows	JD 4450	D	10	14.07 - 17.40	15.51	0.39 - 0.59	0.49
	JD 2140	D	2	9.60 - 9.80	9.70	0.36 - 0.42	0.39
Harrow Packer	JD 4450	D	14	15.15 - 27.27	19.95	0.67 - 1.68	1.05
Spraying	JD 4450	D	21	7.30 - 13.10	10.19	0.30 - 0.68	0.45
	JD 2140	D	4	5.38 - 6.49	5.98	1.09 - 1.32	1.22
Fertilizer banding (dry)	JD 8440	D	12	27.46 - 38.18	32.26	2.06 - 3.18	2.53
Valmar Spreader	JD 4450	D	1	-	11.96	-	0.53
Swathing (pull)	JD 4450	D	12	10.00 - 12.40	11.60	0.91 - 1.97	1.24
	JD 2140	D	3	7.05 - 7.34	7.20	0.53 - 0.78	0.64
(SP)	CCIL 550	G	9	-	-	0.64 - 1.36	0.81
Combine	TR85	D	25	18.19 - 30.09	24.80	1.93 - 4.30	3.10
Rock Picker	JD 4450	D	1	11.83 - 14.54	12.58	-	0.34
(seeded acreage)	JD 2140	D		5.24 - 6.01	5.68		
Heavy Trucks (grain & misc handling)	IH 1600	G	1		6.3 mpg		0.99
Light Vehicles	Chev 1/2 T '77	G			14.4 mpg		
	Chev 1/2 T '78	G			14.9 mpg		
	Chev Van '81	G	1		15.8 mpg		1.52
	Chev 1/2 T '82	G			17.6 mpg		
	GMC Van '83	G			16.5 mpg		

Farm No. 59
NC Dark BrownSoil Zone

Acreage: 826 Cultivated (Total 960)
Cropped 791, fallow 35

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivator (primary)	JD 4430	D	3	17.33 - 22.67	19.52	1.97 - 2.19	2.11
Disc (tandem)	JD 4020	D	1	-	-	-	2.63
Discer (seeding)	JD 2140	D	1	-	12.19	-	2.56
Hoedrill	JD 4430	D	1	7.70 - 19.70	16.22	-	3.00
	JD 2140	D	2	-	-	1.37 - 1.89	1.63
Harrowing	JD 2140	D	1	-	7.99	-	0.66
Spraying	JD 4430	D	1	-	-	-	0.62
Fertilizer banding	JD 4430	D	6	19.44 - 25.00	22.22	2.15 - 3.07	2.53
Swather (pull)	JD 4020	D	1	-	6.67	-	0.80
(SP)	JD 800	G	2	-	-	0.66 - 1.46	0.95
Combine (SP-pickup)	JD 95	G	1	-	-	-	4.19
Heavy Trucks	Chev 3 T	G			5.4 mpg		
(grain & misc. hauling)	IH 3 T	G	-		2.7 mpg		n.r.
Light Vehicles	Chev 1/2 T	G			14.0 mpg		
(general support)	Chev 3/4 T	G	-		10.7 mpg		n.r.
	Pontiac Parisienne	G			19.8 mpg		

Farm No. 60
SW Brown Soil Zone

Acreage: 1470 Cultivated (Total 1600)
Cropped 885, fallow 585

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivator (primary)	JD 4440	D	8	20.12 - 27.17	22.61	1.62 - 2.04	1.82
Cultivator/rod	JD 4440	D	3	20.75 - 23.33	22.16	1.66 - 2.19	1.95
Cultivator/spike	JD 4440	D	1	-	-	-	2.76
Rodweeder	JD 4440	D	3	17.69 - 21.82	20.22	1.53 - 1.66	1.58
Hoedrill	Vers. 276	D	6	10.57 - 16.77	14.29	1.14 - 1.48	1.31
Harrows	Vers. 276	D	1	-	-	-	0.73
Sprayer	JD 1830	D	1	-	-	-	0.26
Swather (pull)	JD 1830	D	3	4.73 - 5.18	4.98	0.37 - 0.71	0.57
(SP)	IHC 210	G	1	-	-	-	0.49
Combine (SP-pickup)	NH TR 85	D	4	20.00 - 32.98	26.49	3.28 - 4.90	4.32
Heavy Trucks	Dodge 3 T	G	1		7.9 mpg		0.80
(grain & misc. hauling)	Fargo 1 T	G			-		
Light Vehicles	Ford 1/2 T	G			8.4 mpg		
(general support)	Ford Fiesta	G	1		28.1 mpg		0.91
	Chev Car	G			18.9 mpg		

Farm No. 62
NE Black Soil Zone

Acreage: 950 Cultivated (Total 1000)
Cropped 950, hay 50

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	Case 1175	D	5	13.63 - 28.95	23.04	1.09 - 2.54	2.18
Swather (pull)	Case 1175	D	5	9.63 - 10.86	10.12	0.82 - 1.13	0.96
Combine (SP-pickup)	NH TR 75	D	14	15.54 - 21.72	17.51	1.98 - 5.78	3.64
Heavy Trucks (grain & misc. hauling)	C40 Chev	G	-		7.1 mpg		n.r.
Light Vehicles (general support)	Ford 1/2 T	G	-		9.7 mpg		n.r.

Farm No. 63
EC Dark Brown Soil Zone

Acreage: 1147 Cultivated (Total 1280)
Cropped 1147, fallow nil

Field/Farmstead Operation	Machine Unit	Fuel Type	No. Obs.	Litres per Hour Range	Litres per Hour Average	Litres per Acre (d.f.e) Range	Litres per Acre (d.f.e) Average
Cultivators (primary)	JD 8440	D	4	26.42 - 27.59	27.01	1.96 - 2.20	2.08
Press drill (d.d)	JD 4430	D	3	10.25 - 11.28	10.91	1.03 - 1.41	1.17
Harrows	JD 4430	D	1	-	11.43	-	0.40
Sprayer	JD 4430	D	2	5.20 - 5.46	5.33	0.19 - 0.51	0.35
Fertilizer banding (anhydrous)	JD 8440	D	6	27.76 - 36.72	31.35	1.64 - 3.22	2.24
Swather (pull)	JD 4430	D	3	8.68 - 8.84	8.76	0.92 - 1.10	1.04
Combine (pull-pickup)	JD 8440	D	6	14.68 - 23.99	20.90	2.61 - 4.20	3.36
Heavy Trucks (grain & misc. hauling)	Chev 4 T '79	G	1		2.7 mpg		1.83
Light Vehicles	GMC 1/2 T '71	G			8.7 mpg		
(general support)	Volvo '74	G	1		24.6 mpg		n.r.
	VW Rabbit '76	G			28.9 mpg		
	Dodge Aries '82	G			28.1 mpg		